Vol 2 No 2

February $3*

# The Australian COMMODORE REVIEW

The Independent Australian Magazine

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**World Games**
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# The Australian Commodore Review

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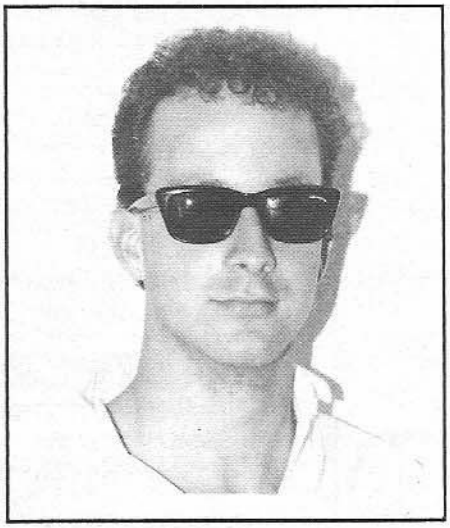
# Editorial



*Andrew Farrell*

In their usual nonchalant fashion, Commodore are poised to release yet another bombshell on the home computer and small business market. Announced in vague terms by Gareth Powell in the *Sydney Morning Herald,* Commodore continue to remain very tight lipped about the existence of what we believe to be called the PC 5.

It is an IBM clone killer, priced to sweep clean the crowded floor of big blue look-a-likes. Selling at a mere $999, not including the monitor, it has a single built in 5 1/4 inch disk drive, 512 kilobytes of RAM, five expansion slots, and for around $1399 will be bundled with a package called *Able-1* and suitable monitor. We wait in earnest. Release date? . . . real soon now.

Of even more significance is the delivery of a large bundle of goodies at the end of March - what can they be? The new Amiga perhaps? I will set up tent and camp fire across the street to bring you further updates.

Already 1987 is heating up to be another action packed year of developments.

And now a brief note about our number five disk magazine. Due to circumstances beyond our control, some programs were inadvertantly left off initial runs of the disk. We regret this and wish to make it clear that recent batches do contain all of the programs originally intended to fit on the disk.

Do check your disk directory with the one appearing on page 29. If you are missing some programs, please feel free to send us your old copy to have it updated.

A full directory of what's on all our disk magazines - past and present - should give you a better guide to purchasing.

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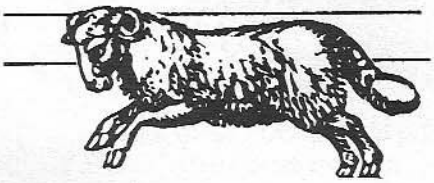
# RAM RUMBLINGS



## Desktop Publishing available on Commodore 64!

A considerable number of dealers are now importing a new selection of packages for the Commodore 64 including Geo-Publisher and Geo-Laser.

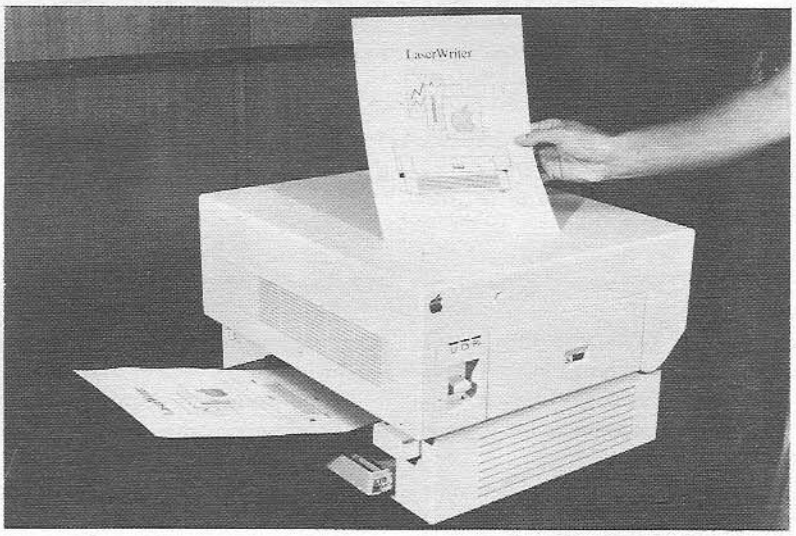
Using this software, along with the necessary cable and interface we expect it will be possible for the Commodore 64 to drive an Apple Laserwriter and produce pages much the same as a Macintosh or PC.

Producers of SYDCOMS user group magazine, Peripheral, are currently experimenting with the set up. Geo-Laser uses the Post Script language to drive the Apple Laserwriter thus producing high quality laser images ready for use in publications such as this magazine.

Along with its companion GeoWrite or the Writers Workshop, the GEOS environment will soon become a new home for desk-top publishing. A system could be purchased for many thousands of dollars less than has previously been possible.

No doubt such a drop in minimum system requirements will set the desktop publishing industry on end.

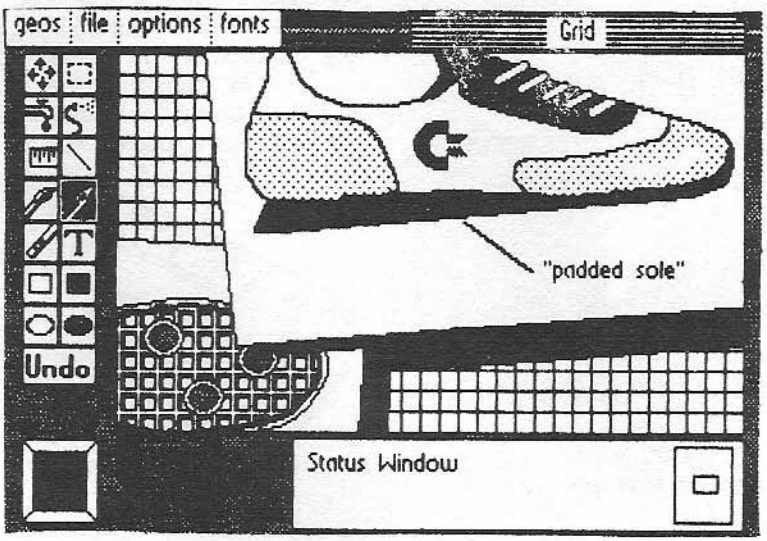
Watch out for an extensive write-up next month.




## Commodore Review at PC87

If you're at the PC87 show in March, be sure to visit the Commodore stand to receive your free copy of our March edition. Reviews of several new Commodore products will be included as well as our usual round-up of news, games and plenty of programs, hints and tips.

It could also be your big chance to meet some of our dedicated staff who cruising around the isles (wearing dark sunnies as usual). Don't miss it.




## Programmers Wanted

If you're a bright spark of any age or gender, and you can write interesting programs in BASIC or machine language, please contact us soon. We are looking for programs to publish in these pages, and on our ever popular disk magazine. Yes, you can even make a few dollars in the process. Call now on (02) 398 5111 for further details.

## New Megasoft titles

Utilities can really make life easier, especially several of the new releases from Megasoft. Full reviews of all these packages next month, but just briefly there's a smart disk cataloging program that is a breeze to use and provides very convenient directories of your entire collection. After the disk directory has been read into the master catalog, you may edit out names of files which are not actually programs you run.

The software produces a complete directory in a variety of formats, as well as individual labels for specific disks.

Other releases include a BBS for both the C64 and C128, and the hallowed war-games dialer. Distributed by Pactronics, - very reasonable pricing.

# Multi-User Switch

The Multi-User Switch from Micro Accessories offers the unique capability of operating up to twenty Commodore 64 or 128 computers with a single 1541 or 1570 disk drive unit.

This factor outshines the already available "VIC Switch" which only offers an eight way selection to the drive. But not only that, it also can be used in conjunction with the highly powerful and fast "Dolphin DOS" system offered by Micro Accessories.

Together the DOS and the switch offer a complete solution to the problem of sharing a single drive unit such as may be required in a classroom or user group environment etc.

The switch may be used as a simple 20 way serial switch but it is recommended that the Dolphin DOS conversion be done to the disk drive and a compatible Kernal be added to each Commodore 64 or 128.

Using simple mathematics one can appreciate the fact that what would probably take 20-30 minutes to load an average program into 20 computers will be reduced to less than five minutes with the use of the switch together with "Dolphin DOS". This cuts down the preparation time required for a classroom or user group activity to a minimum.

The switch owes this capability to a microprocessor which is constantly polling the users for disk access requests and instantly granting sole access to the drive to the user with highest priority. When the transfer is complete the switch is allowed to re-connect at lightning speed to the next in line.

Since the current user has sole access at any one time, data corruption due to cross talk and loading in the system is non-existent and it does appear as if the user has a dedicated drive unit during the access period.

Economically the advantages are obvious since only a single drive need be purchased for 20 users. And the fitting of "Dolphin DOS" to only one drive unit also means a large reduction in cost. The modifications required to the Commodore 64 and 128 are minimal and are the least expensive portion of "Dolphin DOS".

In summary, the switch is a facility not to be ignored by anyone considering the possibility of multi-user access.

Its high speed of operation and high user volume capabilities sets it apart from other systems.

For further information: Micro Accessories of SA, (08) 252 0881.

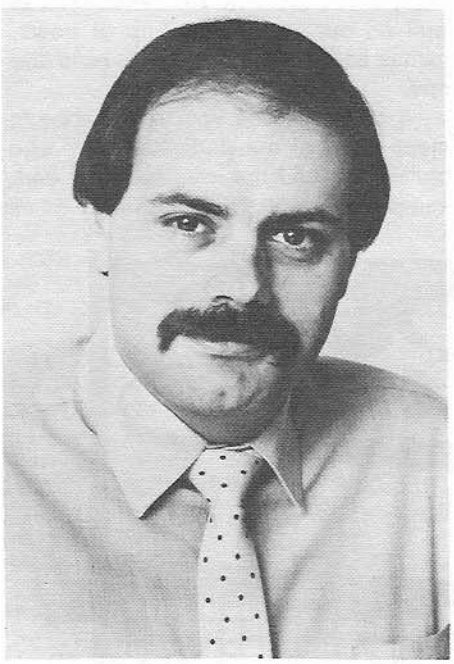
# Family Pack Success

Commodore's Family Pack which includes the official America's Cup game has been a huge success, notching up an incredible 45,000 sales in the last ten weeks.

Sales remained strong as the racing off Fremantle drew to its inevitable climax.

Commodore Australia/Asia-Pacific managing director, Mr Tony Serra, said that the strength of the Family Pack together with strong sales of the Amiga and MS DOS machines gave the company a 30% increase in sales over the previous December quarter in Australia.

"The rocketing sales have come when the rest of the market has been happy to mark time," Mr Serra said.



*Tony Serra,*
*Commodore Managing Director*

The additional revenue has come at a time of much higher productivity by a more dedicated staff, following a re-organisation during last year. Further sales increases are anticipated over the next six months.

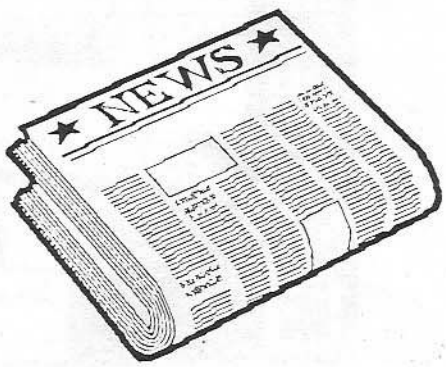
On the business front, Commodore will have three different Amiga CPUs as part of its 1987 line-up together with two new PCs and some new peripheral items.

Mr Serra said, "We have geared ourselves for sales increases created by the strongest mix of available consumer and business computers ever seen in Australia from the many players in today's market place."

Commenting on operations of Commodore International Mr Serra said, "The strategies and goals established on a world-wide basis have continued to remain on target.

"This will be emphasised more in the near future with the visit to Australia by Mr Thomas Rattigan, the President and Chief Executive Officer of Commodore International, in March for PC 87 and the Commodore Dealer Conference.

"1987 should be a boomer without any question at all for us, and will continue to strengthen the dominant position Commodore hold in the Australian marketplace," he said.



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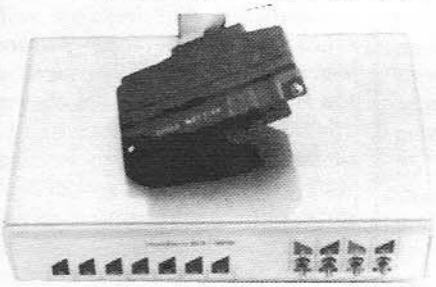

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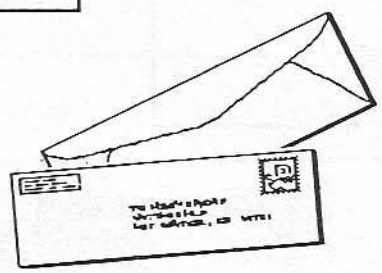
# Letters



Dear Sir,

I am writing to you because I am in dire need of help. The problem is my Commodore 64, after approximately 15 to 30 minutes of use, crashes. The symptoms are that first a loud humming noise will come over the speaker, then shortly afterwards the screen will freeze and become full of irrelevant characters and other junk.

I have tried everything to solve the problem, but the only thing that seems to work is placing a fan behind the computer. I think the problem is something to do with the computer overheating, but this is only a theory.

Recently I had three chips replaced, these were the 6569 VIC, 6581 SID, and the 6526 SID chips. This hasn't helped. Any assistance would be greatly appreciated.

Matthew Griffith
Marsfield

**ED:** *I can sympathise with your problem as one of our 128Ds recently suffered a similar problem. It appeared to be linked to some faulty memory chips. However the technician now informs me that he is waiting on a replacement power supply unit. Sounds like a problem for a professional - try Gabe at United Computers on (02) 29 5088.*

Dear Andrew,

It may be going back quite a while, but in the December 1985 issue the "Rat" mentioned the RC1000 watch released by Seiko. I have not heard about the watch since then. Could you please send me some information on it.

In the August 1986 issue, a "Commodore 128 Incompatibility Chart" was published. I am curious to know whether the games listed are incompatible with the computer itself or the 1570/1 disk drives. I am curious because I own a 1570 (God help it) and am thinking of buying a 1541 as well so I can load all software. I was told not to throw my 1570 in the bin because it still makes a very good boat anchor.

In an article written by Paul Blair in the May 1986 issue of *Australian Commodore Review*, he mentioned that he hadn't the faintest idea of what COLINT, MOVESHAPE, RLUM, RREG, and RSPR did. I now know that RREG returns the values of the Accumulator, X and Y, and Processor Status registers. The format for the command is: RREG variable 1, variable 2, variable 3, variable 4. It works in both immediate and program modes. Its abbreviation is R shift-R. I knew it existed because it was listed in the keyword table in the Basic Rom. I extracted the rest of the information from "Compute!'s 128 Programmers Guide."

An interesting SYS call on the 128 is 32800,123,45,6. This brings up six names, at least one of whom can't spell "hardware", and an obvious protest against armaments. Its equivalent on the +4 is 52651. Something even more interesting is that of the names that came up, I think that nearly all of them helped to write the "Commodore 128 Programmer's Reference Guide."

Something else interesting is that the previously mentioned book does not to the best of my knowledge, mention RREG, even though it was written by the designers of the computer.

I'm getting a modem soon and would appreciate it if you could give me the phone number of your bulletin board which the "Rat" noticed to be out of action.

Are your disk magazines 1 to 4 still available as I'm interested in purchasing them.

I'm also very interested in electronics and radio. Do you know where I might find radio communication equipment for my computer? I never see it advertised anywhere.

I have only one complaint centred on the *Home Computer GEM*, why do you only publish hints for the games on tape?

Lastly I would like to congratulate you on two excellent magazines, *Australian Commodore Review* and *Home Computer GEM*. *ACR* has given me many hours of enjoyment.

I anxiously await your reply to my perhaps too lengthy letter.

Kyle Grimshaw-Jones
Oxenford Qld.

**ED:** *Well, what a plateful. Let's start at the top and work down. Firstly, the watch mentioned was distributed for some time, however a similar version which is somewhat better is now available from Casio. Best to give one of their dealers a call.*

*Software compatibility with the C128 is a problem primarily associated with the 1571 and 1570 disk drives, as the ROMS differ substantially from the 1541. However there are also a handful of packages which are incompatible with the Commodore 128's slightly different architecture even in Commodore 64 mode.*

*Our BBS is still off line - but you'll find a huge list of other systems around in the January issue of Australian Commodore Review.*

*Disk magazines 1-4 are available, along with disk magazine number five, just released.*

*As for radio communications on computer, CW Electronics did have such a device, however I have neither seen nor heard much about it of late. Can anyone else help?*

*Disk based hints and tips are arriving slowly.*

Dear Sir,

In *The Australian Commodore Review,* Vol 3 No 8, August 1986 there was an article on the Commodore MPS-803 printer by Tim Walsh. In this article he said that you could buy the MPS-803 printer for $100 or less. Could you please tell me if this statement is correct and if so where I can buy this printer for this price.

Gary Hurst
Rose, SA.

**ED:** *Sorry, they were US $$$ - our apologies.*

*The MPS-803 has been discontinued. In its place is the MPS-1200 which sells for $550 (Aust $$$) and has better quality at 100 cps.*

Dear Sir,

A question in the mind of many Commodore 128 owners, including myself, is that of connecting a reset switch to the C128, which works in both 64 and 128 mode, without disturbing the computer's memory. Does the reset switch on the side of the C128 serve this purpose or is it simply an alternative to turning the computer off and then on again?

If a reset switch is set into pins 2 and 6 of the Serial I/O port and the C128 is in 64 mode, will the computer reset and stay in 64 mode, as on a normal C64, or will it pop back into C128 mode as by pressing the in-built reset button?

Could you please answer my question as I dare not fiddle with my C128, in case disaster strikes.

Patrick Danek
Cowan, NSW.

**ED:** *The 128's built in reset switch works exactly the same as the one you described on the serial port. There's no need for any further switches.*

Dear Sir,

I have just bought the new Commodore 64c. I am fascinated by the things it can do and how very, very popular here. However, I bought some magazines so I could get into programming and in the UK magazine "Your Commodore" it showed some machine language. And so I typed it out and when I typed RUN and return, it just said Syntax Error READY. So I checked the program and nothing was wrong so I ran it again, it said the same thing. Now can you please tell me what do I need for machine language and how to use it.

Richard Sanchez
Eastlakes, NSW.

**ED:** *Machine language may only be entered using a suitable monitor or Assembler. You cannot simply enter the listing directly as you would a BASIC program.*

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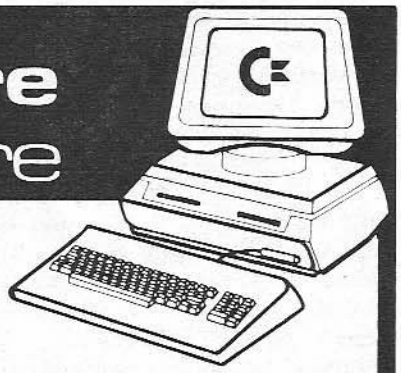
commodore computer centre



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# Easy Intercomputer Connection

## A simple 3-wire RS-232 interface

This article describes how to connect together two Commodore 64s, VIC 20s, +4s or any combination of two of them. Implementing this connection requires only a user-built cable and some BASIC programming; with the cable in place, any kind of data communication between the machines can take place.

Today the price of a Commodore 64 or VIC 20 is very affordable and many owners of one machine are tempted to buy a second one. If you are attracted by this possibility or you already took advantage of it, I am sure that one of the most interesting projects you would like to accomplish is to connect the two machines together and run somehow in a dual processor environment.

There are actually several ways to connect two micros. The fastest and more versatile would be to use the cartridge expansion port; this would require an interface cable and a program or subroutine to handle the protocol. This protocol naturally should be designed around the signals available on the port and would be almost impossible to write in BASIC because of the speed needed to handle these signals.

Another connection could be made through the user port. This would not be as powerful as the first one and would need an interface cable and a protocol handler. This program or subroutine could be written in BASIC, but the speed would suffer a lot. Several examples of this connection can be found in computer magazines, and are almost all based on the concept of parallel data transfer.

## RS-232

The third way of connecting two machines is using a serial connection, known also as RS-232. This line discipline is an industry standard and can be used with various protocols.

On the Commodore 64, VIC 20 and +4, RS-232 protocol is built into the Kernel and can be used with an adapter via the user port. Why do we need an adapter? The answer is that to save on cost for an option not always used, Commodore decided not to use true RS-232 signal levels, providing instead an optional extension on the user port. This means that in theory we cannot use the RS-232 line discipline without extra hardware, but actually that hardware is needed only to translate the TTL signals generated by the motherboard into the RS-232 signals accepted by some serial equipment.

The cable described in this article does not need any translation, because we use all signals at their TTL level, allowing connection of the Commodore machine using this feature. In addition, it uses the simpler '3 LINE' handshaking, requiring only Ground, Received Data and Transmitted Data lines.

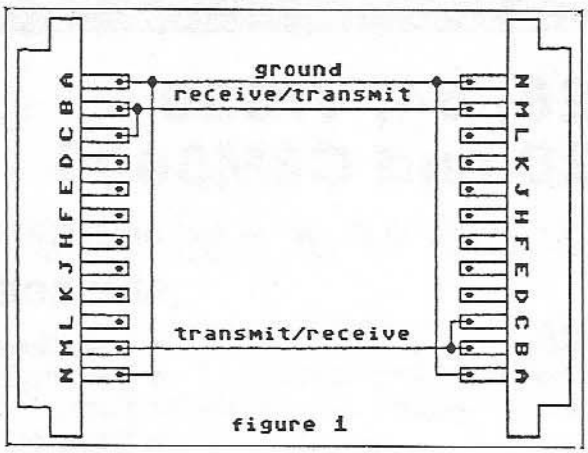

figure 1

## Building the cable

To build the cable, you need to get two connectors compatible with the user port. I got mine at a local electronics store and I am sure that, being a pretty standard product, they are available everywhere. Another thing you need is any three-wire cable. I used a flat cable just because it happened to be in my junk drawer; a handy telephone cable will do a fine job too.

Referring to figure 1 you can make the few connections needed. While the connections are not many, if you are not familiar with a soldering iron and small projects, I suggest you rely on a friend to avoid a possible waste of time and money.

Here is a brief description of the cable functions; for complete information, page 355 of the *C-64 Programmer's Reference Guide* gives all the user-port pin-outs with the names of RS-232 signal lines. If you hold the connector with the protruding pins facing you, place the side with the letter 'A' on the left hand top. If the connector does not have letters and numbers, just assume that the leftmost top pin is 'A'. As you can observe from the connector or from the *User's Guide* page 143, not all letters are used; the exact lettering is A B C D E F H J K L M N.

Connect pins A and N with a wire bridge; those are both ground and their connection is a good practice. Make another bridge between pin B and C; they handle both the Received Data signal, but pin B is internally connected to a detection circuit, able to generate an interrupt when a character is coming from the line. Do the same bridges to the other connector and now you can link the two by the three-wire cable. If the wires are different colours there is no problem, else better make sure with a tester or some other means which wire is which on each end.

Connect first the ground, pin A or N, both sides; then connect pin M on one side to pins B and C on the other side; this is the Transmitted Data connected to the Received Data. Do the same connection for the other wire in the reverse direction. Now both connectors should look the same, with pins A, B, C, M and N soldered somewhere. To complete a durable connection, the connectors should be put in a headshell of some type which covers the soldered connections.

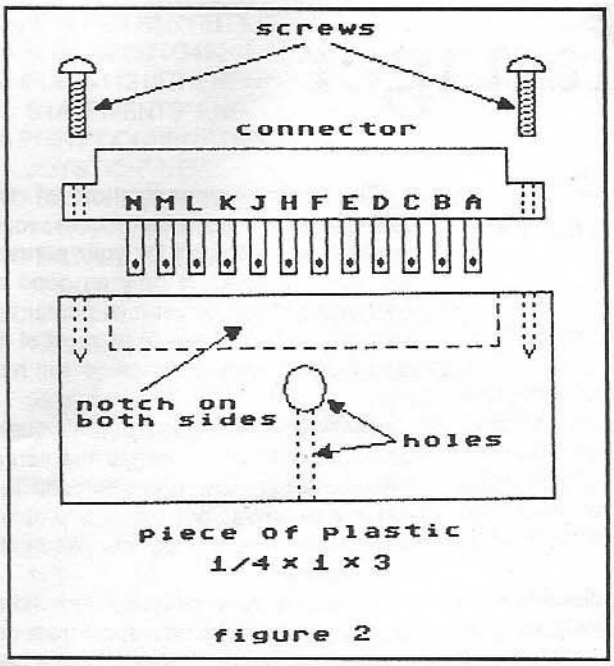


figure 2

To test the cable you can use your favourite terminal emulator program on both computers, or if you're using C64's or VIC's you can use this simple one:

```
10 open 2,2,2,chr$(8)
15 rem above sets: 1200 baud, 8 bit, no parity
20 get#2,a$:get b$: print a$;b$;
30 if b$<>"" then print#2,b$;
40 goto 20
```

With the above set-up, you can communicate between computers simply by typing on either keyboard. As a practical use of this communication channel, you could set-up a distributed processing system. For example,in a database system, one computer could accept input from the user while the other maintained the database on disk. That way, a record could be sorted and stored on one computer while the user is entering the net record or typing in a query on the other. This would result in major time savings in most circumstances.

# Headshell

I chose to make my own headshell from a piece of plastic of 1" by 3" by 1/4" (25mm by 75mm by 5mm). In figure 2 there is a sample of this home-made assembly.

First I filed down one edge on both sides to fit between the top and bottom rows of connector pins. Then I drilled two holes corresponding to those on the connector, to fit the holding screws. Next, with the width of the cable to be used in mind, I drilled a hole about 1/2" or 15mm deep into the edge opposite the connector pins. Last, with a very large drill top and gouge, I carefully opened a hollow into the 15mm cable hole, through which the cable will be brought to the surface of the headshell.

The cable can be inserted into the hole with the wires coming out from the hollow and connected to the pins. A couple of pieces of insulating tape on each side of the headshell to cover the pins should finish the job. Do not forget to pass the wire through the hole before making the connection if you choose to make this housing.

It is very important to mark the connector with a label indicating the side that must be up; inserting the cable in the wrong position will mean connecting to +5V and +9V power sources. It is easy to determine the position looking at the finished connector; the side with no soldered pins is the top.

With one end of this cable plugged into the port on each of the two machines, it is now possible to transfer any kind of data directly from BASIC. The built-in RS-232 routines allow communication by simply OPENing a file to device number 2 and getting GET# or PRINT# to receive or send.

Using a data word length of eight will allow you to transfer not only alphanumeric but the full Commodore character set (graphics, tokens, etc.) making it possible to transfer BASIC or machine language programs, graphics, portions of memory, etc.


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# Business Manager

*Balance the cheque book and budget for that second disk drive, modem or printer using Business Manager.* ***Andrew Farrell*** *put this Aussie package through its paces.*

I have never been a great one for keeping records of things. As a result my life is in continual disorder and disarray or disorganisation and also distress. That is until I got Business Manager. Now I can see that I am underpaid, overworked and underfed as J Mark Hunter so aptly pointed out.

Nevertheless, I write on. If you have trouble keeping track of all those nasty expenses and balancing them against the Thursday pay packet then you need this program.

One year's trading is stored on a disk, with 50 expense categories and two income categories. These may be spread amongst 200 different account names, with up to 150 expenses per month. Periodical payments like your car finance, housing loan, or alimony are also allowed for.

Both monthly and yearly summaries may be printed and you can also make a backup of your data - so important in Sydney's stormy weather.

Upon booting up (the program appears to fast-load) you are asked whether or not you require instructions.

A neat idea that immediately overcomes all those people who, like myself, are too lazy to look them up in the manual.

Although the on-screen directions are brief, the program is relatively easy to understand, and each option is described in clear terminology.

You are next asked to insert a data disk - or a blank formatted disk if this is your first time.

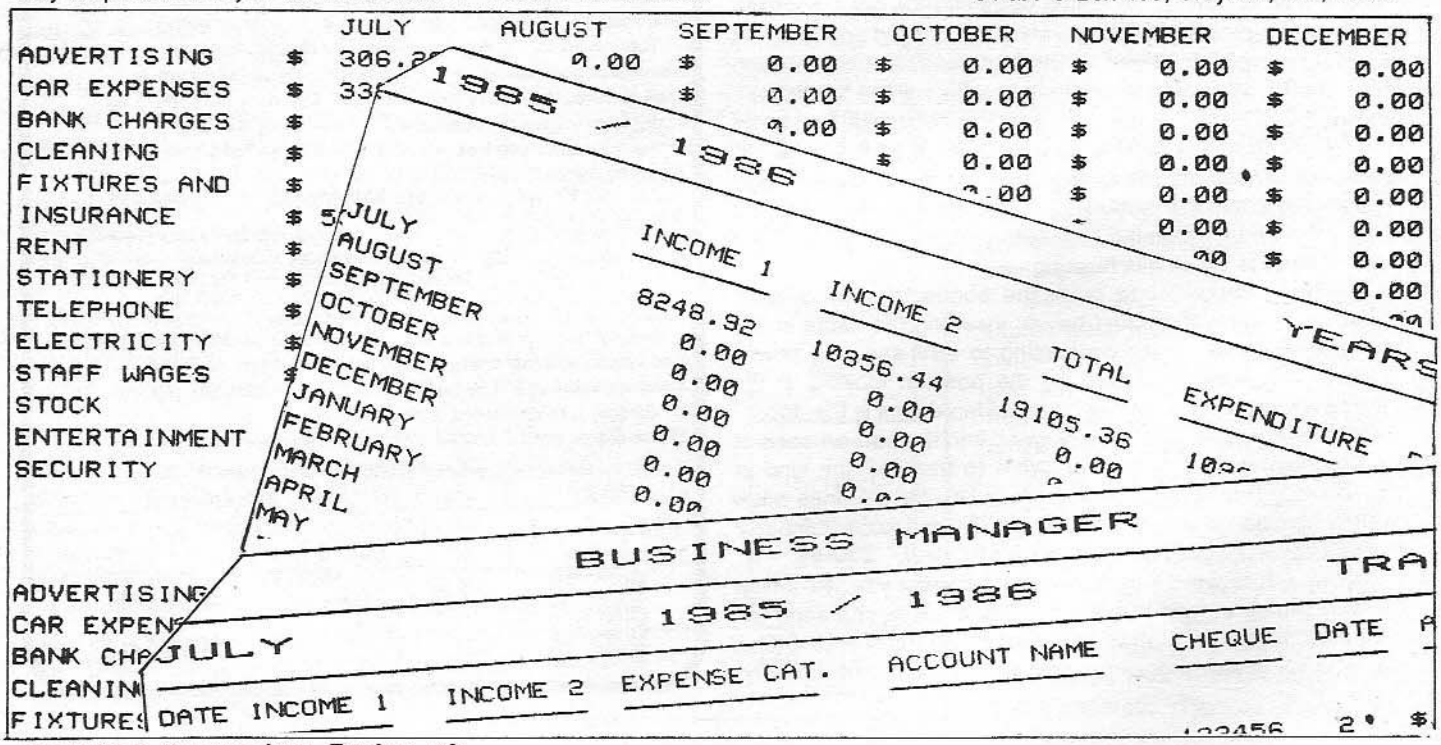
Next, the main menu, where thirteen different options provide access to the program's facilities. Some of these require the program disk to be reinserted. Although this is rather annoying, the program takes little time to load whatever information it needs.

The best demonstration of the package is the reports it produces, some of which are included for your perusal. Any such program is only as good as what you can get out of it. A printer is a necessity in this instance, as most of the reports may only be viewed on hard copy.

On screen editing is tight, although I would have liked to change the screen colours. A tad slow if you're used to a faster disk drive, but that's a problem facing any program of this ilk on the Commodore 64.

In all, a very practical functional program that works well apart from one small gripe. The restore key has not been fully disabled, which I worry may lead to the loss of information, and possibly the corruption of valuable file data. Perhaps the next version will have this problem solved.

An Australian product from a company who promise they intend to bring out many more such titles and are on the lookout for authors. Further enquiries should be directed to Software 64 at PO Box 483, Croydon, VIC, 3136.



# Rich man, poor man, beggar man, pirate

*Pirates beware, software houses are preparing to do battle. This time they are well armed - thanks to a new group of vigilante type organizations who are providing confidential leads as to the identity of offending individuals. By Andrew Farrell.*

Guessing as to the extent to which sales are lost to the whirring dual disk drives and lock picking programs is no easy task. Estimates run as high as 100 illegitimate copies to every dinki-di package sold off the shelf.

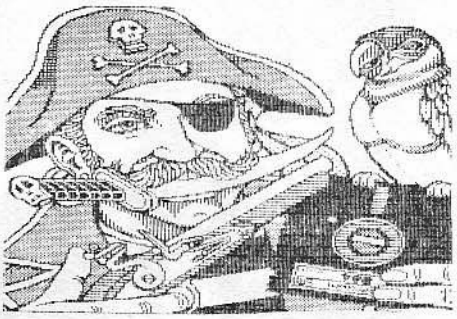
Dollar value of these losses varies considerably, but for now the issue on the minds of software companies is not to establish what has been lost, but rather to find ways of reducing the deficit in the future and to establish alternative policies to ensure the problem does not worsen and possibly even improves.

Some feel that one means to this end would be to make an example of a few so as to inspire dread in the souls of similarly minded people. Would this simply lead to a tightening up of pirates' means and methods? Would they set sail for smoother waters elsewhere? Or perhaps they'll just build bigger battleships. Whatever the results of such action, no doubt the pirates will continue to thrive for the moment.

## How to spot a pirate

You won't find him standing at the helm of a square rigger, or hobbling along on one leg to the sound of a squawking tattered cockatoo. Although he does have a ship of sorts, and even a crew, and he certainly has a sword.

He tends to be a little blase about his activities or achievements. His sword is the latest swag of copy breaking devices and programs. His ship is the protective surroundings of his immediate peers who equally enjoy the fluid supply of free software. More often than not the modern day pirate's clipper is the 'User Group'. Founded as a means by which users of a particular brand of machine may swap ideas, exchange information and try out new products, they sometimes turn into full scale swap clubs where even pre-release versions of programs are readily available to all and sundry.



But the moon has shifted and the tide is turning. Responsible members of the public have recognized that the activities of a few are destroying the future for the masses of users who need the support and backup that off the shelf purchases provide.

Small groups are springing up, who, in vigilante fashion, provide positive leads to prime offenders of the copyright laws.

Their identity is confidential, their activities are secret, yet they strike hard and fast. One such group is called GASP. Perhaps they are the last gasp for the industry, or a fresh breeze of air that may well prove to be a curbing force in the field of piracy.

The name stands simply for Group Against Software Piracy. Their ranks are diverse - industry professionals and figureheads down to backyard hobbyists. They work by penetrating the ranks of of user groups, bulletin boards, and computer circles in general to establish credibility and ascertain ring leaders in the piracy game.

Once sure of their findings, names, addresses and the alleged activities of these persons are passed on to software houses in the hope that further action will be taken. Some companies do respond with stern letters demanding action. At this time no case has ever been followed through to a court of law, as most people respond in a cooperative fashion, ceasing further illegal activites.

Providing that these scare tactics continue to be effective, groups such as GASP will achieve much in cleaning out the rotten wood. If you are involved in pirating computer software, be warned. It is an offence that may warrant investigation by the authorities.

So, perhaps it is time to hoist the sails and set a course for new waters for all those wooden legged maties out there. Tinker, tailor, soldier, sailor. Rich man, poor man, beggar man, running scared.

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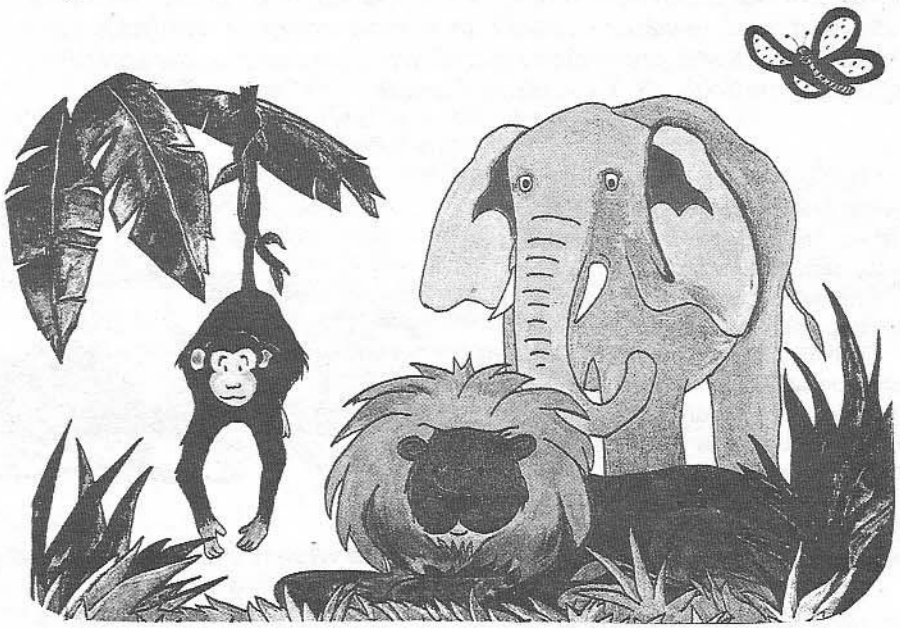
# Animal Kingdom

*by J Mark Hunter*



In my study where I have my computers set up is also an aquarium with cold water fish in it swimming amongst the plants and orange gravel. Okay, they're not exotic saltwater varieties and only some bulging-eyed black Moors and orange goldfish, but we were kind of close. They are peaceful to view and cheap to feed. If one dies I can easily replace it with another for just a buck fifty, but I've had a couple of them for over six months now and they've guided me silently into a lot of hours clocked in front of this computer, looking over my shoulder at the screen to see what I'm writing as they methodically gape their mouths around the tank.

Four citizens of the Animal Kingdom.

And, yep, there's a game for that too.

Unicorn Software of 1775 East Tropicana Ave, Las Vegas, Nevada, 89109.

Now, should we be cautious about what we're feeding our kids, and especially if it's being developed in the sin capital of the American west?! Naa, cos I've checked it out and there's nothing perverse or crooked in the whole disk. The cost of the products these days might be a rip-off, but that's about all.

This is a game that's not too cool, but junior's going to like it for a dead afternoon in fall.

*Animal Kingdom* is an Early Science program consisting of six different learning levels. (Early Science is like kindergarten birds and bees).

It teaches you all about animals with an electronic animal encyclopedia, it shows the kid a picture of an animal in its native habitat and asks Becky to identify it by spelling its name. Not content with just labelling it correctly, the kid must first unscramble the letters to get the proper appellation.

There's a category called "Who Am I?" - object: the child/kid/little human/small persona etc, must correctly identify an animal's mug shot from several details about its nature, behaviour and habits. "What's Different?" is an activity where the child must select which animal from six animals depicted is from a different species. Incorrect answers are given detailed explanations. An animal memory game is a concentration game for one to four players featuring an enchanting pictorial display.

Better than alphabet soup and more technical than McDonaldland cookies, *Animal Kingdom* will teach children about the many different species of animals ranging from prehistoric animals to reptiles, insects, nocturnal animals, birds, jungle creatures, pets, etc, while augmenting their language arts, reading comprehension, discrimination and memory skills. A special way to introducing kids to the intriguing wonders of science and nature.

To take a closer look let's get into the "Who Am I?" category. Six animals appear on the screen. A brief explanation of one of the animals will be displayed at the bottom of the screen. Enter the number corresponding to that animal's description and if the answer is incorrect another explanation will come up. If the answer is incorrect, try it again. After a second incorrect response, the true answer will be shown. After two sets of animals the score will be displayed.

For instance on came up saying: "I have a snout and a long tongue. I like to eat termites and ants. I have sharp claws. Who am I?"

Hmmm? Then, it had pictures of a penguin, elephant, scorpion, anteater, eagle and turkey. I picked turkey and was wrong. But it was a learning experience. Now I know that penguins eat more than fish, let me tell you.

It is important to note that young children and beginning readers will need help reading the descriptions included in this program module. Once they have become familiar with all the animals in the program's library they can enjoy the other five games with minimal supervision. (Chester used to help me, but now, Chester's dead).

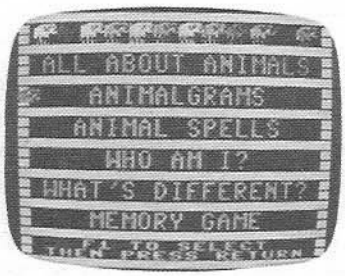
All about Animals is an introduction to the various animal groups and some of their characteristics and helps you understand the other sections of the program more easily. It presents a sampling of members from each of the

groups included in the program's graphic library.

The graphics on *Animal Kingdom*, though, are poor, and the colour dulled into a lot of flesh-coloured areas of the screen display. A kid will enjoy it, but not for long. At seven they're going to want to start into something heavier, like *Strip Poker* so I'd suggest getting into chewier material right from Run/Stop and things like the Disney products do that with quality ease.

Should not be passed over, though. If the kid in your house has all the others or if you have an infant that already speaks Burmese then *Animal Kingdom* is the disk to boot.

Besides, he can always chew on the box.




**AUSTRALIAN COMMODORE REVIEW RATING CARD**

**Game: Animal Kingdom**
**Machine: Commodore**
**Publisher: Unicorn**
**Distributor: OziSoft**
**Price:**
**Tape: $19.95**
**Disk: $24.95**

| | |
|---|---|
| Graphics: | 72 |
| Presentation: | 69 |
| Documentation: | 64 |
| Music: | 71 |
| Sound: | 72 |
| Impact: | 76 |
| Overall: | 74 |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# TRAILBLAZER

*by J Mark Hunter*

Northern California. An hour's drive south of San Francisco Clint Eastwood just became mayor of the most precious and delicately beautiful city I have ever seen - Carmel.

I was on the beach, and it was sundown. Clint wasn't there, but present with me were four Brazilian female models dressed in beach attire. And there was a photographer, a director, and one other man I talked to first. The chairman of the Brazilian Council of Shopping Malls, in the United States for a convention.

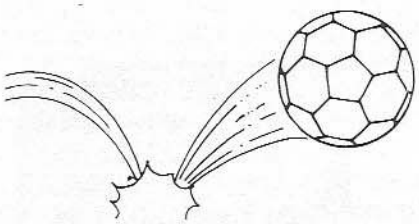
He had rented a car in Frisco and driven down to Carmel late that afternoon to watch the photographic session because one of the models was his girlfriend. As soon as it was over they were leaving immediately to catch a night flight to Chicago. The session had gone on longer than scheduled. The Brazilian chairman became quite frustrated and urged the photographer to hurry and get the session over with.

The photographer, a hotshot professional from L.A, was starting to get a little incensed at the continual harassment from the South American and returned a volley of abusive shouts. A fight broke out and the photographer was knocked to the sand.

The other man, the director, tried to intervene but to no avail, and the models started screaming either in excitement or fear.

They were wrestling around on the sand and it was all in their faces and eyes. The photographer called for a truce and the chairman finally agreed, demanding that his girlfriend be allowed to leave.

When permitted to get to his feet the LA guy stood away brushing sand out of his hair and cursed the Brazilian, then turned

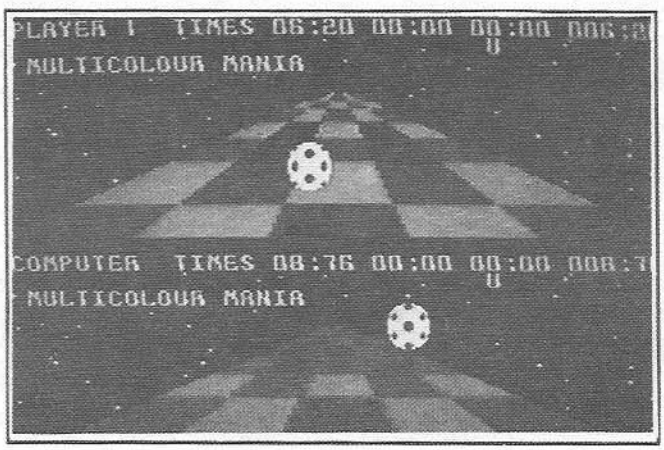


his attention to his girlfriend and swore that she'd never work with him again.

The model started crying and told her boyfriend she refused to go with him to Chicago. He stormed off the beach and sped away in his rented Cadillac. The session was ruined. This is where I came in.

Because the photographer was so upset, he took it out on everyone concerned and all the other models became embittered toward the Brazilian's girlfriend and left her stranded on the sand. She started crying, but there was nowhere to go. She didn't want to head back up the beach to the hotel because she was sharing a room with one of the other models. And she couldn't go much place else because all she was wearing was the bathing suit. A gorgeous Brazilian model was stranded on the beach after sundown ... and J. Mark Hunter was there.

Dot, dot, dot.




We had coffee, and I had a copy of *Trailblazer* in my car.

From here on in I'm going to tell you about the game - if anybody wants to know what happened later you can write in to the magazine.

Here's a quote that I found myself ranting during the course of the game: "totally excellent graphics", yes, cos they are. Some of the best I've seen for so, so long. Farrell practically shoved this game into my hands when I got in the door the other day and said you just have to play this game!

And we played the game, and the magazine became another day later.

Then there was talk about the colour, described as great - you don't get into Thesaurus kind of language when you're busy at the screen, man, "great" babbles forth pretty regularly. "Great playability."

"What did you say?"

"I said, great."

"Oh, yeah, great."

I noted with pen and A4 bond paper that I was loving the game.

So, what's the game?

Determination, speed and dexterity - the key assets needed to complete *Trailblazer* successfully.

Thundering into the unknown at breakneck speed, like an empty car on a transit lane at peak hour, agile negotiations of what's there, like bends, other things. Got to roll left and right to avoid cracks, but at the same time being careful not to fall off the edge of the path as you go.

What am I talking about, how do you play this thing?

Well, the aim of the game is to guide the ball down each of the 21 different courses as quickly as possible while avoiding the holes and other obstacles. Each course has its own time limit and there are five selections.

It's like a pumped up bowling game but much more. More like being on a skateboard going down a mountain road with no way of braking and fist size rocks littered down in front of your path.

You are limited to seven jumps per course and have a set time on each one. If you get through a course faster than the clock can tick down the remaining time is added to your next run. You get the greatest score by completing as many courses as possible.

You bounce from one square to the next, with maximum velocity issuing the highest scores. There are ten points per square and 100 per square on warp. Additionally, there are bonus points for time remaining on completion of a course and 1000 extra points per round on bonus game every three levels.

The various squares you must contend with are characterized by their colours.

Blue - bounces your ball into the air.

Purple - throws you backwards.

Cyan - reverses the controls, i.e. a left move becomes right.

Green - speeds you up.

Red - slows you down.

White - warps you out.

Colourblind people can go hellbent and kamikaze.

Reminds me a little of *ElectraGlide*, or any other type of racing game, but here you're manipulating a ball through the treachery and ignorance.

It's fun, nobody dies and not a bullet or missile is shot. It's colourful, entertaining and demanding and should provide you with a lot of fun.

The Brazilian girl liked it, but then, *Frank Bruno's Boxing* would have had the same effect.

**AUSTRALIAN COMMODORE REVIEW RATING CARD**

**Publisher: Gremlin**
**Distributor: ISD**
**Price: $34.95**

| | |
|---|---|
| Graphics | 73 |
| Presentation: | 81 |
| Documentation: | 76 |
| Sound: | 52 |
| Music: | 47 |
| Impact: | 79 |
| Overall: | 68 |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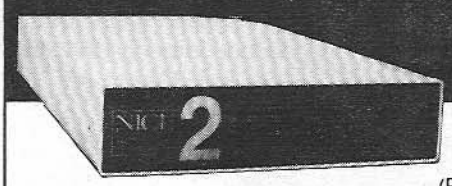

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TRADE ENQUIRIES WELCOME

# WORLD GAMES

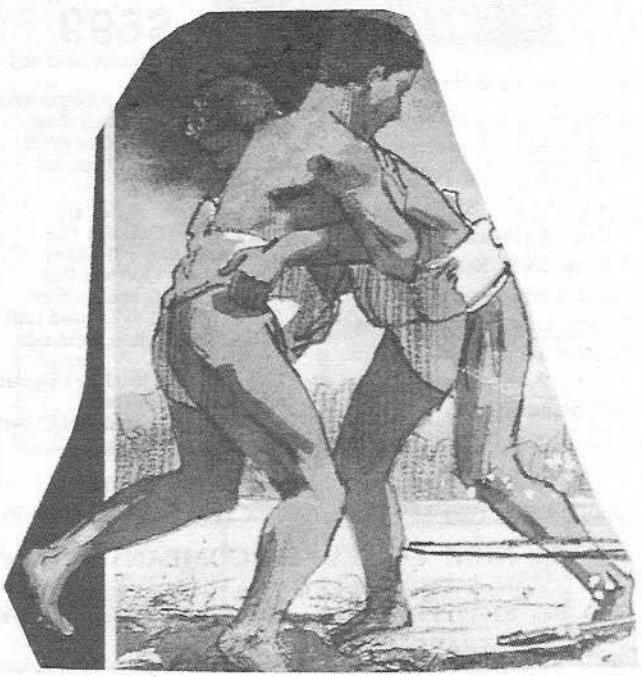
*by Stephen Gordon and Shane Watts*

There aren't many sport simulations available for the Amiga at the moment. One of them, *World Games,* is Epyx's latest addition to their famous collection of sporting games.

*World Games* challenges your competitive skills with a series of athletic contests of one to eight players. The lineup of eight realistic and colourful events takes you on a journey around the world. After sharpening up our skills at each of the events we took our tour of the world to complete in *World Games.*

## Weightlifting

The scene for this event is in Russia, home of the best Olympic weightlifters in the world. The Soviets have ruled the 'Iron Games' since 1960, when 360lb giant Leonid Zhabotinsky squashed his competition by hoisting 1262 lbs in three lifts. The two events, 'Snatch' and 'Clean and Jerk' require timing, skill and determination.



**Snatch:** After setting the weight you bend down as you grasp the weight, pushing the stick forward to begin lifting, and pulling back to drop underneath the bar and snatch it over your head in the squatting position. You then push the joystick forward, standing up from the squatting position.

**Clean and Jerk:** This one is a bit harder, requiring more precise timing in the moves. By pulling back on the joystick you 'clean' the bar and drop into a squat position, with the bar resting on your chest. By pushing forward you stand up from the squat, and to jerk the bar above your head you pull back again. To straighten your legs and complete the lift you push forward.

## Barrel jumping

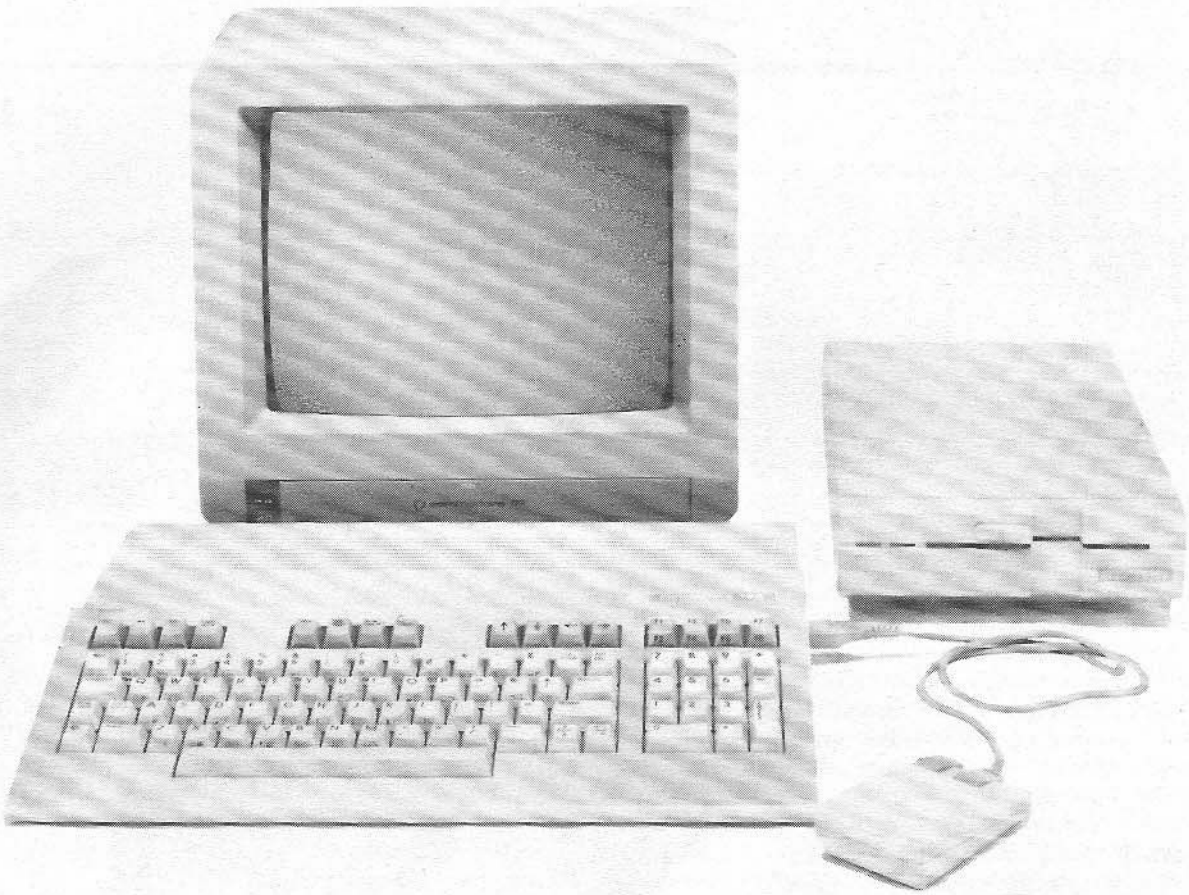
Barrel jumping takes you to Germany, where skaters compete to jump over the most barrels in a single attempt. In their dash before take off, jumpers hit speeds above 40 mph, risking painful bruising if they fail to clear the last barrel.

After choosing the number of barrels you wish to attempt, you start the skater's legs moving by rhythmically moving the joystick left and right with his legs. By pushing the button at the precise moment, you leap in the air, hoping that you have enough speed to clear the barrels. Once cleared you pull down to enable a safe landing. (If this is not done you fall through the ice and watch yourself turn ice cold blue as you freeze in the water.)

## Cliff diving

The cliffs of sunny Acapulco, Mexico, provide the setting for this dangerous sport. High on a cliff named Quebrada, courageous divers launch themselves from a craggy ledge towards the crashing surf far below. To avoid the rocks at the cliff base, divers have to jump 27ft out during their 118ft descent. Diver Raul Garcia has taken this leap over 35,000 times.

You begin by setting the height of your dive (the higher the easier). You start by pushing the button and holding the joystick in the direction that you require the most velocity. After leaping you must push your joystick forward to arch your



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back and thus move further out from the rocks during the descent. Before you enter the water you must pull back to straighten out and complete the swan dive. To avoid hitting the rocks at the bottom of the ocean you must immediately move left after entering the water.

## Slalom skiing

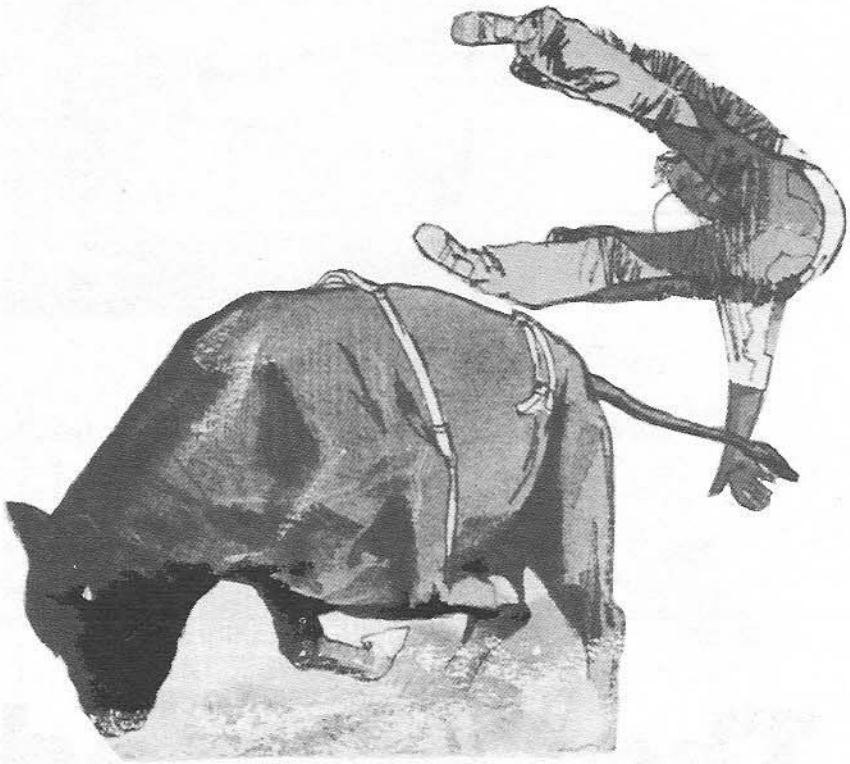
The setting for this event is Chamonix, France, where the first Winter Olympics took place in 1924. Slalom courses are designed as a test of reflexes, agility, precision and control.

To begin the course you push the fire button. By moving the joystick left or right you control your skier's movement, and by holding the fire button you increase your speed and turning sensitivity. You must pass through each gate (no easy task) on your way down. There is a five second penalty for every gate missed. Sharp turns slow you down so you must keep your speed and turning ability moderate as you race down the slope to try and beat the opponent's score.

## Log Rolling

Log rolling brings a visit to Canada, where two lumber-jacks try to dislodge each other from a large floating log, spinning it back and forth until one contestant plunges into the icy river. Needless to say this sport requires great balance and agility.

You may compete against the computer or another player in this sport. The movement in this is basic. Move the joystick left and right in time with your feet and with your opponent's feet. By pushing the button you can slow the roll and change the log's direction. (This event is extremely hard.)



## Bullriding

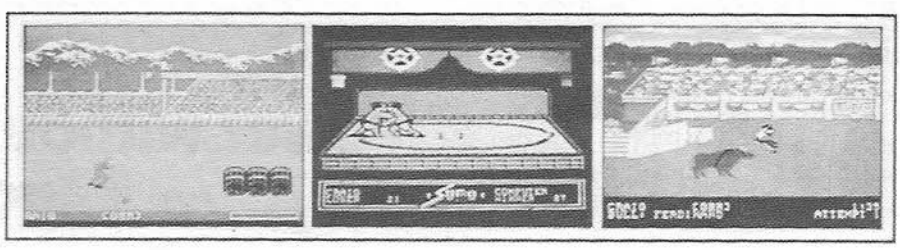
Bullriding is the most dangerous event in rodeo, a sport born over 100 years ago in the west of America, when cowboys challenged each other to contests of riding and roping for entertainment. The rider sits bareback on a wild bull weighing over 2,000lbs, and holds onto a rope to avoid being thrown.

To choose which bull you ride, move the joystick forward or back (if you feel lucky or like a fool try 'Earthquake'). You must respond to the bull's movement. If he bucks you hold the joystick in the direction that he bucks. If he spins you must hold back while he spins around. When he halts you must move the joystick in the opposite direction to the way he is facing.

## Caber toss

The heather-splashed hills of Scotland are the birthplace of the ancient caber toss. In this famous event from the Scottish Highland Games, athletes throw a tree trunk the size of a small telegraph pole. Cabers vary in size. The Braemar caber, one of Scotland's greatest challenges, is 19 ft long and weighs more than 120 lbs.

To run with the caber, move the joystick left and right in rhythm with the athlete's feet. To gain speed increase the tempo of the rhythm smoothly. To plant your feet and throw the caber, press and hold the button. As the caber pivots in your hands, release the button to complete the throw. If you release too soon or too late the caber may not flip correctly.



## Sumo wrestling

Sumo is an ancient Japanese sport with many traditions. Two huge wrestlers grapple in a clay-surfaced ring, trying to topple each other to the ground or push each other out of the ring. Japanese boys must weigh 160 lbs at the age of 13

to enter sumo apprenticeship, and todays pro's often weigh 400 lbs.

You have a variety of moves you can do by moving the joystick in different directions with or without the firebutton. The computer maintains stamina and balance factors for each wrestler.

## Overall views

The background views are very good, but not many of the other graphics come up to this standard. The crowds in the background remind me of the crowds in *Summer Games* on the C64. Some of the contestants are very good, but most aren't. The characters in bull riding are of pretty poor quality (considering the capabilities of the Amiga.) One amusing thing was in Weightlifting. If you didn't drop the bar your lifter's face would slowly turn a darker shade of red, finally ending with you falling through the floor and the weight falling on your head.

The music is only of C64 standard with the same dreadful sounding instruments. The sound effects aren't even really of C64 standard. I think that Epyx should spend more time investigating the sound chip of the Amiga.

## Conclusion

Not a game which uses the full potential of the Amiga, but it still is a good effort. The first games for the 64 weren't even up to the same proportionate standard.

**AUSTRALIAN COMMODORE REVIEW RATING CARD**

Game: World Games
Machine: Amiga
Publisher: EPYX
Distributor: ECP
Price: $89.95

| | |
|---|---|
| Graphics: | 88 |
| Presentation: | 87 |
| Documentation: | 91 |
| Playability: | 89 |
| Difficulty: | 81 |
| Sound: | 66 |
| Music: | 68 |
| Overall: | 81 |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# Trivial Pursuit

*by J Mark Hunter*

Question: How many copies of "Yoko Ono: Absolutely Live!" were sold at the time of its release in November of 1986?

Answer: If you didn't even know she'd released one, then you shouldn't be choosing question from the arts category. Besides, like everyone else out there - you didn't buy one. None.

Question: How old was Dick Smith when he first ran away from home and called it an adventure? Part B: where did he go?

Answer: Twenty-three. Front porch steps.

Question: When was the first time that The Dead Kennedys used the Melbourne Symphony Orchestra on their Australian tour?

Answer: After Elton John, before Neil Sedaka.

Question: What would have been Billy Joel's chances of getting Christie Brinkley a a wife if he wasn't rich and famous?

Answer: As good as yours.

Question: How many koalas have pooped on Japanese tourists in the last two fiscal years? This does not include the San Diego Zoo.

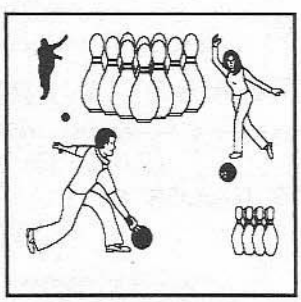
Answer: Six thousand and twelve.

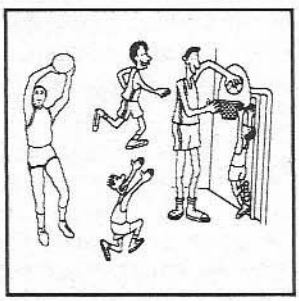
Question: What is the latest opening act for the Taronga Zoo sea lion show?

Answer: Andrew Farrell computer seminars.

You can't go more trivial than that!

Trivial - insignificant, unimportant, trifling, petty, paltry, measly, slight, picayune: ("of small value"), (it's a word). Trivial from the Latin "TRIVIALIS of the crossroads', three via roads, to signify





places you see, pass, etc. everyday; something commonplace.

Pursuit: ie. 'one wedding carnation for each of the groomsmen pur suit.' From the Latin PRO-forth and SEQUIT - to follow.

So the essence of it then is to 'go after something of small value' - like a teenybopper's phone number, Jimmy Carter's autograph, The Bay City Roller's Collection.

This game from Domark on computer and on the shelf now, is a fulfillment of the title - not much scratch, stick to the board game on the shag pile in the living room in front of the TV around the peanuts and chips on a Friday night with your cousin's friends and a 2MMM commercial-free hour and a half on the AIWA. (I'd just like to say at this time that I do not get financial kickbacks by these companies for free plugs, they're just part of our last-quarter-of-the-twentieth-century vocab. Mine, anyway.

What they tell us is that *Trivial Pursuit, the Computer Game* is a "faithful reproduction of the original board game" but "with many enhancements and features to make it even more fun to play."

...Na, I don't agree, pal. Listen, I had it on over at Farrell's house - he lives in an old Wang monitor case in an IBM dispatch depot near the airport - and as soon as he saw me with it he ripped it out of my hands and jabbed it into his drive - the disappointment set in like springtime frost on the broken, rusted roof of a Himalayan goat shed. It was to sum it up in one word - corny and stunted.

They continue, "the program has been designed to be as friendly as possible and is largely self-explanatory."

... Okay, (I hold up my hands in a gesture of mild surrender), that part's fairly true, though I think the Genus II edition was a bit pushy.

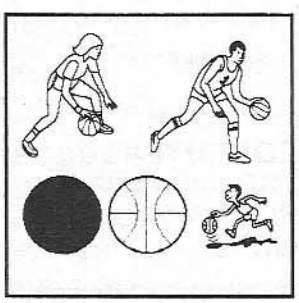
The object of the game is that the winner is the first player to return to the central hub and correctly answer a question in a category chosen by the other players. Before attempting a game winning question, a player must land in each of the six category headquarters and correctly answer a question.

If you've never played this game before, here's a rough assessment. A player throws a token to the board and it lands on a designated square symbolizing a category from which he must answer a question. On the screen version the token is a computerized "dart" or icon.

If the player answers correctly, his or her turn continues. If the answer is wrong the turn moves to the next person on the list. When the player is in a category headquarters (at the end of a spoke) and answers correctly he is given the appropriately coloured scoring wedge. If the player lands on the grey "throw again" spaces, then a further throw is given.

If a token lands on the hub before it is full of wedges, then the player may chose any category of question. This is done by moving the joystick and highlighting the subjects below.

Once a player has his wedge full of six tokens or token full of six wedges whatever comes first, he makes his way



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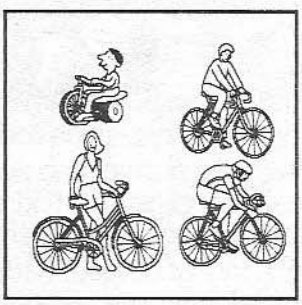
toward the central hub, and must land exactly on the hub. Once there, the other players choose the category of question to be answered, and to win, this question must be - you got it - answered correctly.

When you've got *TP CG* loaded...*(Trivial Pursuit Computer Game),* the first thing to do is to type in each player's name, you can have 1-6 players. Then you have a number of options. You can edit names (if someone makes a mistake or someone joins, leaves or wishes to continue the game), set a time allowance for answering questions (between 5 seconds and 9 minutes), and decide whether or not to include "TP" (the little ikonfaced dude that bounces around the game on the screen) within the game.

Sound effects can be turned on or off - that's two options, and the sound effects are pretty hopeless so I turned them off and played Springsteen's "Nebraska" instead - just as monotonous. You can load automatically a new block of questions and importantly, check the place of each player on the score screen. These can be chosen by moving the highlight bar up or down and then pressing the fire button.



Once you have decided on your options simply highlight the "New Game" choice on the menu and press fire to enter the game.

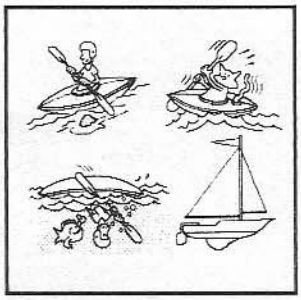
You will find yourself on the board screen with "TP" waiting for you. From here onwards movement through the game is controlled by the joystick or keys. To move on in the game you have only to press the button. At several points in the game you are asked to make choices. Just move the joystick or press the keys in the required direction and press fire to continue.

Whether "TP" asks you a text, music or graphic question there is no need to type in the answer. Simply say your answer out loud and press the fire button to see if you were correct. Just as in the board game, it is up to all the players to decide whether the answer is near enough.

When the questions contained in the main programs are used up you can use new questions from the "Uniload Question Pack" on tape/disk.

One special feature of the computer game that does not appear on the board game is the Score Chart. Before throwing a dart you can return to the option menu and by choosing "Score Chart" you can find out how you are doing. Are you answering more questions than your opponent? Is she or he better at sports questions than you? All this is worked out and shown to you by the computer.

When it gets to the point that one of the players has arrived at the centre hub you can, by pressing the option key, see their analysis chart and pick their worst subject for them to answer.



And, if your cousin's friends are not around or you're shut up in a Himalayan goat shed during a blizzard by yourself, you enter only one name into the list at the beginning and you are automatically into the one player mode. You must answer the questions as quickly as you can and try to complete the game. The computer will time you and keep a record of your answers. At the end you will be given a score based on your performance.

Graphics are nothing superb, babes, let me tell ya. The colour squeezes into the same category and as mentioned before the sound is bland and decrepit.

It's okay to play, but could have been made a little more adultish and faster moving. it's kind of neat, I guess, if you're into computers, and want to impress those friends of yours that aren't, but are into Trivial Pursuit. It's a novelty, but soon wears off and hits Yawn City limits by late evening.

Final Question, then: What happens if you do suddenly find yourself in a Himalayan blizzard and there's no goat shed?

The Answer: "Scream and Die" is close enough.

## AUSTRALIAN COMMODORE REVIEW RATING CARD

Game: Trivial Pursuit the Game
Machine: Commodore, Amstrad
Publisher: Domark
Distributor: ECP
Price:
Commodore
Disk/Cass: $39.95
Amstrad: Disk $49.95
Cass: $39.95

| | |
|---|---|
| Graphics: | 53 |
| Presentation: | 57 |
| Documentation: | 66 |
| Sound: | 64 |
| Impact: | 65 |
| Overall: | 62 |

# Defender of the Crown

*by Stephen Gordon and Shane Watts*

Well, we can hardly believe it. It's here. We saw some of the graphics at United Computer in Sydney in December. We were very impressed. We're the first one on our block with it and it's a winner. We must confess that we are the only one in our area with an Amiga but we consider that irrelevant.

In case you have never heard of *Defender of the Crown* we must tell you a little about it. The publishers call it Cinemaware; in other words it's like a motion picture. There is some similarity; the pictures are very good and some of them do move.

With this game you need to know how to read but not how to type. Everything is done with the mouse. The opening screen is one of the most impressive; a metallic gold title that shines while the stereo music plays. The game that really shows off the Amiga. An indication of the talent behind this game is that the pictures were done by James Sachs - you know, his name is in the corner of many of the Public Domain pictures around the place. R J Mical, the author of a major part of *Intuition,* did much of the programming.

After the title screen it gives you some history. The game is set in the age of chivalry, the time of Robin Hood - an important character in this game - a time of knights, castles and fair maidens in distress. These are all important elements of this game of strategy, conquest, jousting and swordplay. In case you haven't guessed, this is a male oriented and somewhat adult game.

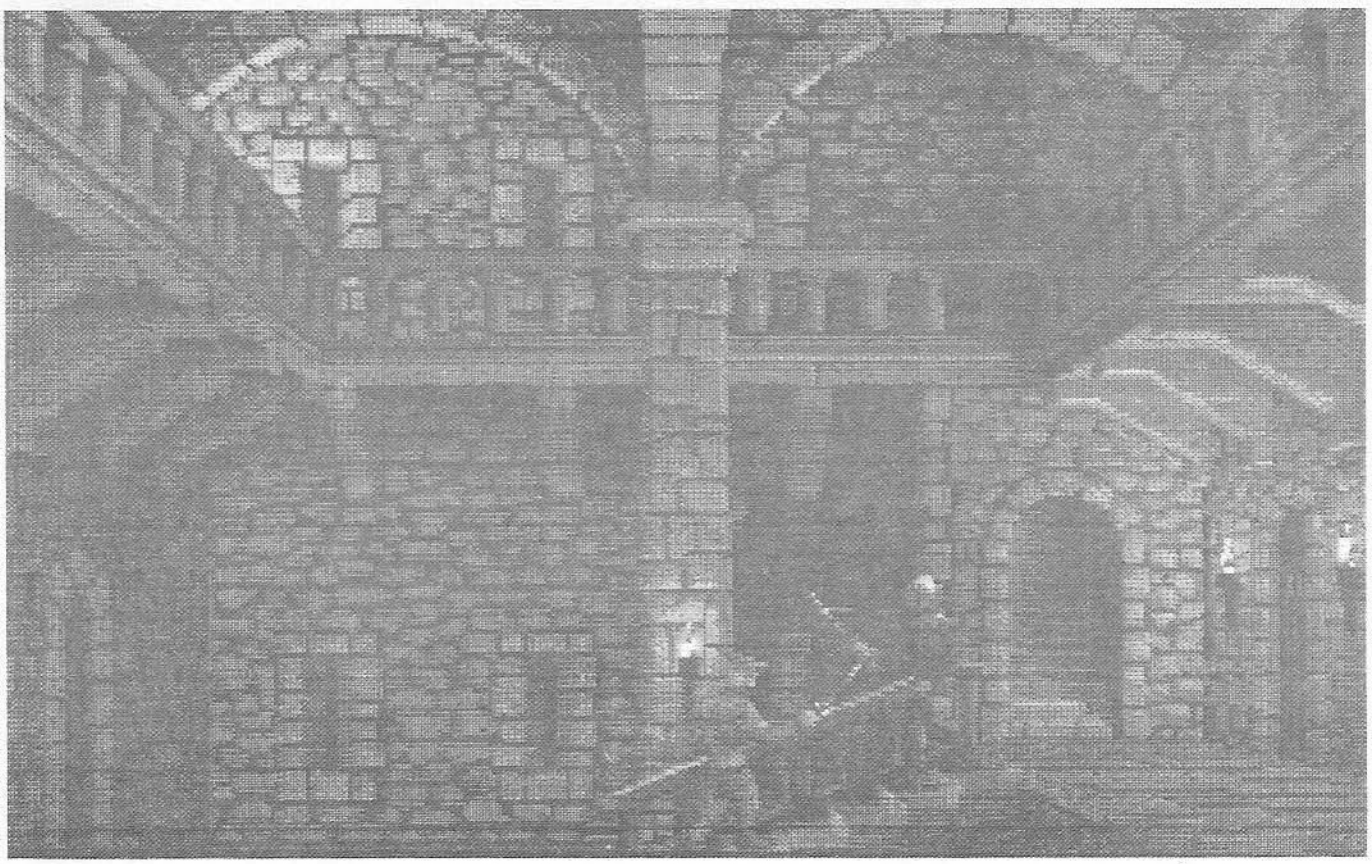
The first of many choices is which of the four Saxon lords you wish to become. You are given a list of talents that each has. For example: leadership, swordsmanship, and jousting ability.

The object of the game is to increase your fortunes and lands by waging conquest and raids upon the neighbouring territories owned by Norman and other Saxon lords, and ultimately to capture the three Norman castles and be crowned the new king.

You must learn to fight with sword, lance and catapult. You will lead armies of knights and foot soldiers. How well you lead and fight will help to determine the final outcome.

Of course, as in most games, luck plays an important part in *Defender.* A band of thieves may attack the sheriff's tax collector, thereby reducing your income. While you are out raiding and pillaging, your home castle could be put under siege.

At any time you may be asked to rescue a captive Saxon maiden. If you are fortunate enough to rescue her, your



reward will be most pleasant. This is where the "adult" that I mentioned before comes in. I'll leave what happens next to your imagination.

Now I mentioned swordsmanship, jousting and catapults. This is where the "motion" comes in. When you sword fight, you move the man on the screen and his sword. You can lunge and retreat, parry and thrust. You are in control.

The tournaments are most impressive. Trumpeters, banners waving, crowds smiling and nodding in the stands, horses restless and waiting. It's all there.

You choose an opponent and then the real action begins. You have very little time and you must be very accurate to unseat the other horseman galloping toward you. I have yet to win a joust. Of course I keep choosing the best swordsman. Just one hint: He has the best chance of rescuing the fair maiden.

At first Stephen thought there was too much repetition of graphic screens until he realized that if there were more different scenes the program would have taken more than two disks, and disk swapping is more distracting than seeing the same castle interior. It is recommended that you play the game in the dark and I agree. It does give it a more movie-like feeling. And since there is no typing needed, you really don't need the light.

Though we were really impressed with the quality of this game, we were certainly not impressed with the packaging. The very first thing Shane noticed when he picked up the box was the rattling. There are two disks for this game and they were both just loose in the box. The box is too big for its contents. The beautiful illustrations on the cover of the box could just as well have been on one of those folder type diskette packages that hold the disk in place. The slim booklet giving history, background and instructions for the game would also easily fit in the same folder.

Review copy was supplied by United Computers, 207, Clarence St, Sydney NSW 2000. (02) 29 5088

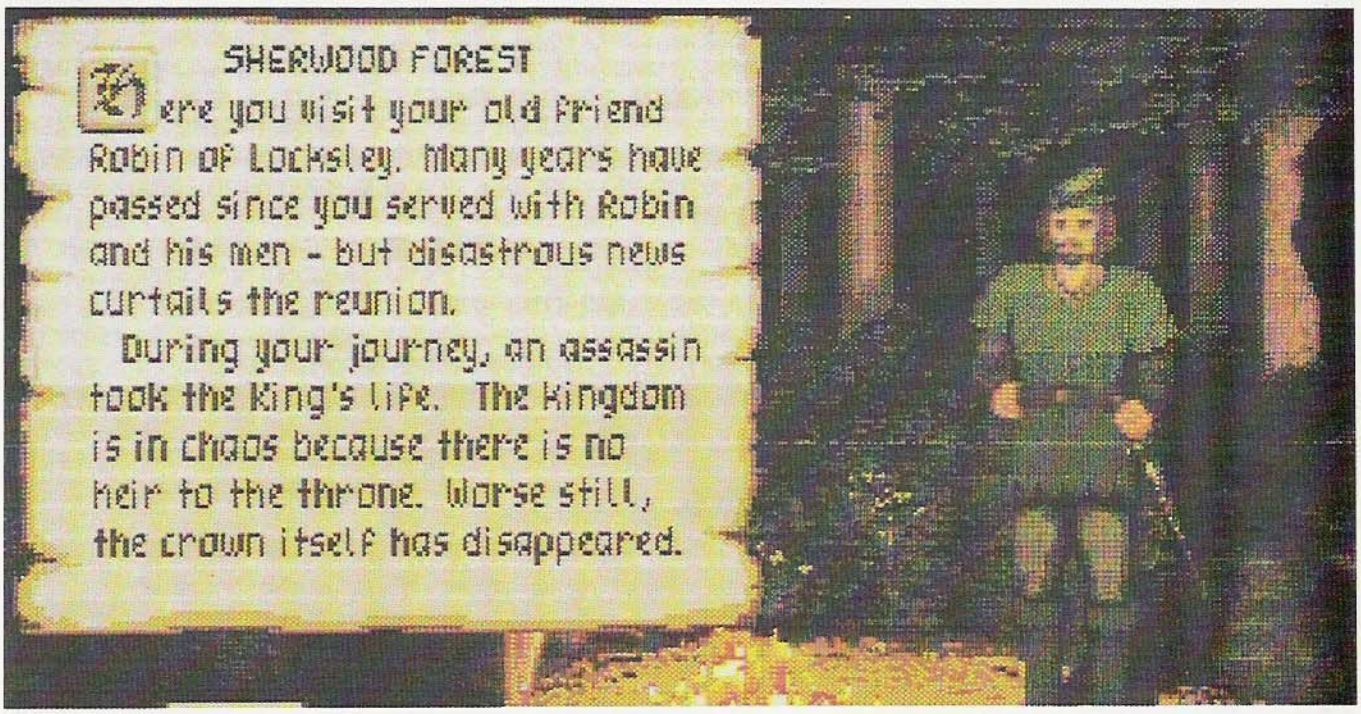
Also, on the way are three new Cinemaware programs. They are: *King of Chicago, SDI,* and *Sinbad and the Throne of the Falcon.*

These programs are said to be as good as *Defender of the Crown* and they live up to the Cinemaware name.

## AUSTRALIAN COMMODORE REVIEW RATING CARD

Game: Defender of the Crown
Machine: Amiga
Publisher: Mindscape
Distributor: Imagineering
Price: $120.00

| | |
|---|---|
| Graphics: | 100 |
| Presentation: | 80 |
| Documentation: | 97 |
| Sound: | 99 |
| Music: | 100 |
| Impact: | 99 |
| Overall: | 96 |



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# DEACTIVATORS

*by J Mark Hunter*

It's what you call - deactivation. Stopping, ending, defusing something about to occur.

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A group of fanatical saboteurs have infiltrated the Gravitational Research Institute and planted numerous time bombs throughout the five laboratories. They have also programmed your robot guards to act against you.

As head of security you must call in your elite force of Deactivator Droids to clear the bombs and repair the computer.

They will have difficulty moving from room to room as floors may be ceilings and ceilings may be walls. Also, the rooms have different gravities. The Deactivators are your last hope to save the institute from destruction!

The aim of the game is to remove all the bombs from five different buildings. You start on level one in a four by four building. The displays at the top of the screen provide a view of what's going on in two adjacent rooms. At the bottom of the screen is a map of the building showing you the position of the droids and bombs. Each droid is restricted in the number of rooms it can move between. Your score is shown in the box on the left, and any bonus droids you have available. The status box on the right shows whether the droid you are controlling is carrying either a bomb or a circuit board.

To remove the bombs from the building you will have to carry them to the exit and throw them out. There is not always a direct route out of the building, so you will have to throw the bomb between a number of droids to remove it. The exit room is the only room with a door which leads to the outside. Certain elements in each building will not function until you replace the corresponding circuit board in the computer room. These include lights, matter transmitters and door or window openings. Some circuit boards are dummies and have no effect and others switch off obstructing forcefields.

You can move around the building in a number of different ways. Through the doors, dropping through the hatches, sliding up and down poles, or using matter transporters.

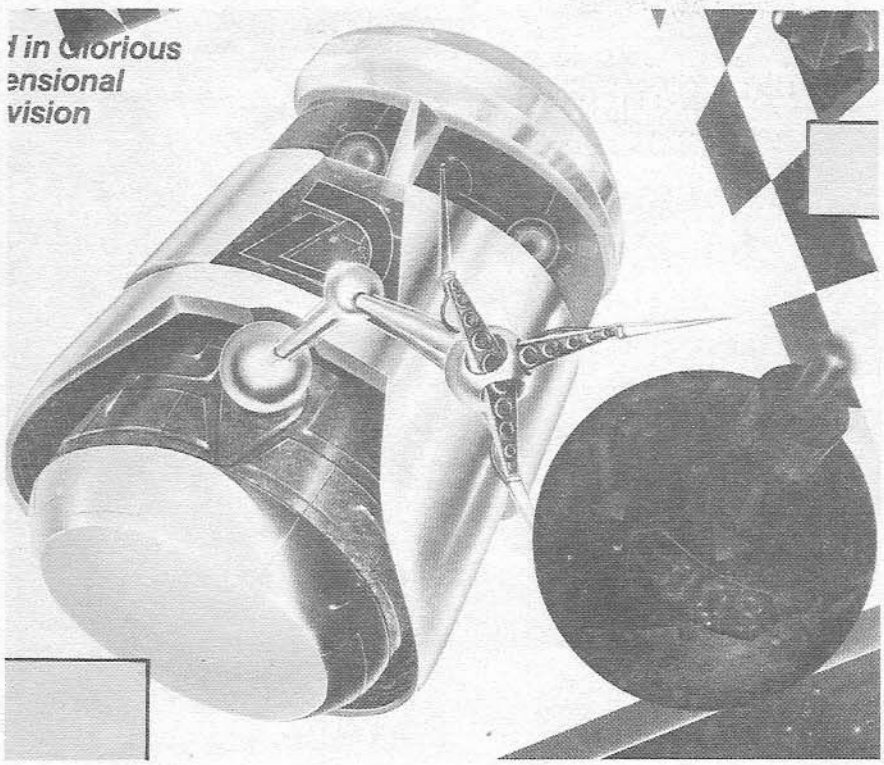
Once the game has been loaded you will see the opening screen. From here you will be able select either beginner or advanced level. On beginner level you have slower guards, more time and more impacts before the bombs explode.

When and if you manage to remove all the bombs from a building you will be placed at the start of the next level.

When a new level starts you will be placed in a droid select mode. Don't be scared, it doesn't hurt.

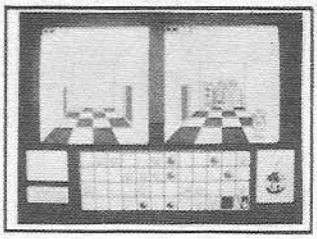
This is shown by the flashing highlight on the screen map. By moving the joystick left and right, the cursor can be moved all over the available droids in the building. Pressing the fire button selects the droids.

When in droid movement mode, left and right on the joystick moves the droid in those directions relative to the floor. Up moves the droid to the back of the room and down brings it forward. Pressing the fire button opens up the control icon window which acts as a game play pause. Any bombs being carried by your current droids will continue to fizz, but time is frozen until you return to the movement control.



All the bombs in the building are set to go off in sequence. If you are carrying an active bomb you will see the fuse burning in the status display. Be careful when throwing a bomb through a window or hatch, try and position a droid on the other side to catch it. When the bomb passes into a new room, control will automatically be transferred to the new droid.

Circuit boards need to be replaced in the computer room to restore the function of certain elements in the building. There is only one computer room per building. To replace a circuit board, move your droid over it. To throw, press the fire button to open up the control icon window and select the bomb throw icon by pressing fire. The display will be replaced by a trajectometer showing the angle and direction at which the throw will be made.



When it comes to the robot guards doing their routines they will only chase after an active droid if they are in the sector of the building. If you go out of the sector, they freeze. Guards can be destroyed only by making them fall through hatches within a short space of time. If a guard makes contact with an active droid, the droid will disintegrate. If the droid is carrying a bomb, then the bomb will explode.

As well, because of the nature of the research being carried out in the buildings, each room has an individual gravity generator. These have been set to one of four strengths and the rooms have one of four orientations.

Points are scored for collecting and replacing circuit boards but more importantly, for the speed with which the bombs are taken to the exit.

We got the needle drifting into the fun zone here, yes, and quite wetted by the enjoyment factors involved. *Deactivator*. Read the bold type and the fine - it all comes out the same - impressive, inducing nods of approval, at least in this room.

Graphics, spelled with capital good, small case brilliance. And sound, and music and the colours on the screen - as above.

Value for money, if you've got any after the Big 25. Worth the trip to the store and the wear and tear on your C64.

I mean, you gotta buy it now - cos the Claus in the Christmas contract has between totally deleted.

Amen.

## AUSTRALIAN COMMODORE REVIEW RATING CARD

Game: Deactivators
Machine: Commodore
Publisher: Ariolasoft
Distributor: ECP
Price:
Disk - $34.95
Cass - $24.95

| | |
|---|---|
| Graphics: | 83 |
| Presentation: | 78 |
| Documentation: | 74 |
| Sound: | 75 |
| Impact: | 79 |
| Overall: | 85 |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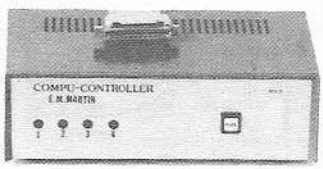


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3d.sim
3d.ult
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blk.mc
rblk.mc
bsave.mc
ched.mac
gothic.set
wacky.set
computer.set
help.pcg editor
help.pcg.boot
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prog.0
prog.00
prog.1
prog.2
prog.3
acr.ecfdemo
instructions
bytsprites
news

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point sq
hangman
typing practice
contents
help
programs
start
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bsave.hi

mcode
bcbset.iii
ahouse.pic
names
bcastle.set
brix-editor
change set
inuse
rblk.mc
bsave.mc
blk.mc
menu
ahi.pic
afrontstep.pic
labyrinth
finance package
nsw bbs list
easy load&run
roadblock-64.doc
roadblock-64
bird invaders
bird source.pas
bird source.txt

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open .sys
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ddtit.sys
main .sys
ddscr.sys
editorial.sys
news .sys
contents .sys
programs .sys
start
byte-put 2.0
cont.loop
screen.8
menu/help
tboot
character editor
old
blk.mc
rblk.mc
bsave.mc
sprite editor
sprites.mc
colour
bsave.$c100
split.demo/help
split screen.mc
help.pcg editor
help graphics
graph.mc
computer.set
wacky.set
gothic.set
raise basic.boot
byts and bites
bytsprites
move.start
animate.help
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dd sgprint
ps bgprint
ps(sm) screen
2nd mps802 m4.es
newsroom loader
m2
802 mcode basic
802 hires mcode
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802 clip art
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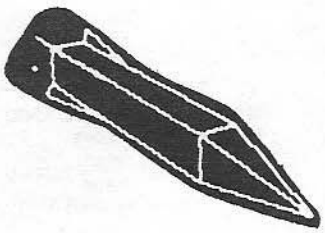
# Infocom Four in One Sampler Part II

*by J A Salt*



As promised I would like to share with you my attempts to play the excerpt of *Planetfall* which is featured on the INFOMCOM-FOUR-IN-ONE Sampler disk. (Readers interested in Part 1 should obtain a copy of Vol 3 No 12 of this publication.)

The main aim of this series is for us to progress through the 'sampler' disk together. By doing this, you allow me the opportunity to share with you some of the basic fundamentals that I have discovered in my many efforts to tackle various adventures. By sharing our experiences, I am hoping to encourage you to persist in your initial efforts which can be very daunting to a novice adventurer.

*Planetfall* is a science fiction adventure written by a very successful member of the Infocom team, Steve Meretsky. It has been given a STANDARD classification for its degree of difficulty to play. The STANDARD level is Infocom's most popular level of interactive fiction and can be enjoyed by both novices and experienced players.

In this excerpt, which has been extracted from the full length version of *Planetfall*, your goal is to find a way to CROSS THE GAPING RIFT in one of the corridors. Your starting location is at the CORRIDOR JUNCTION (with a 6 POINT start).

When you have completed the exercise offered to you, then and only then, compare your efforts with the result of my first few attempts during which I familiarized myself by mapping and examining the locations as I entered them.

**EXERCISE - PLANETFALL EXCERPT:**

**1ST EXAMPLE:**

Look
inventory
drop all
east - (dead-end this exercise)
north - admin. corridor south
north - admin. corridor
west - systems monitors
east - admin. corridor
south - admin. corridor south
look in crevice
take key
east - sanfac E
west - admin. corridor south
south - corridor junction
west - dorm corridor
north - dorm D
north - sanfac D
south - dorm D
south - dorm corridor
south - dorm C
south - sanfac C
north - dorm C
north - dorm corridor
west - mess corr. (locked door)
south - mess hall
take canteen
south - closed door
open door
north - mess corridor
east - dorm. corridor
east - corridor junction
south - mech. corridor north
east - storage east
take all - (oil can, cardboard box)
west - mech. corridor north
north - corridor junction
drop all
south - mech. corridor north
west - physical plant
examine equipment
southeast - mech. corridor
south - mech. corridor south
southeast - robot shop
examine robot
search robot (card-1 POINT)
turn on robot (2 POINTS)
wait
west - machine shop
press red button
west - tool room
take all - (4 items)
examine laser
fire laser (2 POINTS)
northeast - mech.corr.south
north - mech. corridor
north - mech. corridor north
north - corridor junction
drop all
look
take pliers, metal bar, box
north - admin. corridor south
take key with pliers
take key with metal bar
south - corridor junction
drop pliers, metal bar, box
west - dorm. corridor
west - mess corridor
look
open padlock with key
remove padlock
open door
north - stor. west (4 POINTS)
take all-('load too heavy')
drop all ('getting weary')
take ladder
south
east
south
look
drop ladder
lie down on bunk
sleep
sleep
get out of bunk
take ladder
north - dorm. corridor
east - corridor junction
north - admin. corr.south
north - admin. corridor
look
put down ladder
extend ladder
put ladder over rift
north -----
(15 points/93 moves)

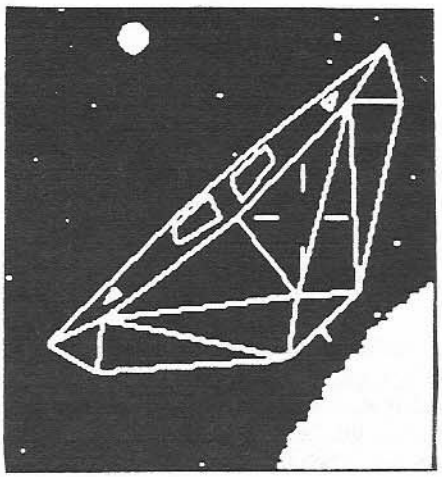
**2nd EXAMPLE:**

s
s
s
sw
take bar
ne
n
n
n
n
place bar over crevice
s
w
w
open padlock with key
remove padlock
open door
n (4 POINTS)
drop all
take ladder
s
e
e
n
n
drop ladder
extend ladder
put ladder over rift
n -----
(10 points/29 moves)

You will note that both examples successfully completed the exercise. However in my second example I was able to do it in 29 moves. The point I'm wanting to make here is for you to be aware than an adventure can be explored in more than one way and still be completed with a great deal of satisfaction for the player.

Obsessive players like myself get a greater sense of achievement in the challlenge of perfecting our game by retracing and refining our moves so that our ultimate score is achieved with as few moves as is possible. Saving at different stages of your venture is important for you to succeed. (As this disk does not have a SAVE program on it, I will cover the advantages of SAVING in a later issue when we explore a FULL Length adventure.

Try hard not to complicate a game for yourself. Map your locations as you reach them. Jot down any objects you come across. Read carefully all descriptions and directions given to you on the screen. If you are unsure of which items to take when you enter a new area type "TAKE ALL" and you will be told what can and can't be picked up. Whether you will need these items, only further



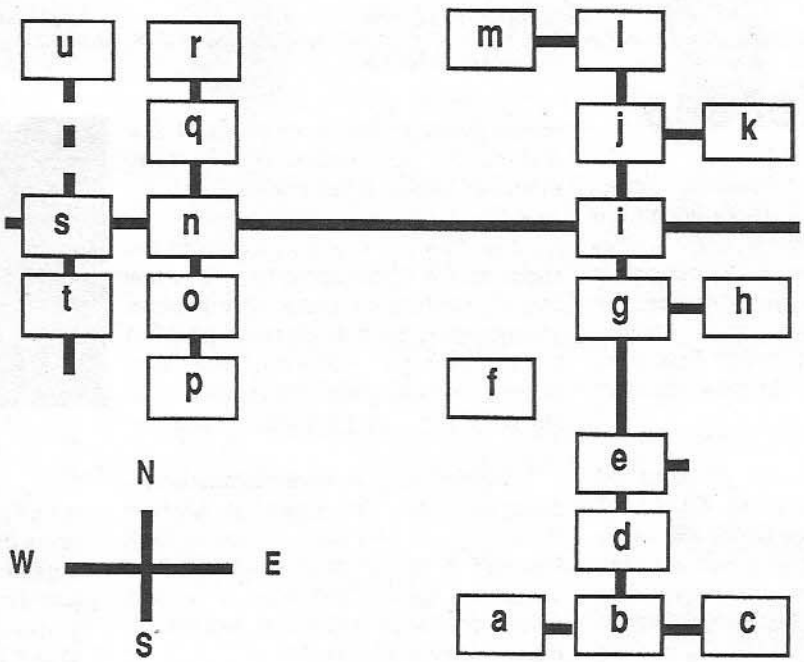
progression into the game will tell. Don't be scared to examine objects found. Open cupboards or desk drawers, press buttons, pull levers, look under bunks. In fact a true adventurer has to have the curiosity of nine cats.

Think of a text adventure as you would if you were going to climb Mt Everest. Every step taken in the climb is an unknown and everything that happens until you reach the top is unexpected.

In a later issue I will give details and a map for the INFIDEL excerpt. I hope in the meantime you will have attempted and enjoyed playing it for yourself. Happy adventuring .

## Planetfall excerpt map and location listing.

a. tool room
b. machine shop
c. robot shop
d. mech. corridor south
e. mech. corridor
f. physical plant
g. mech. corridor north
h. storage east
i. corridor junction
j. admin. corridor south
k. sanfac e.
l. admin. corridor
m. systems monitors
n. dorm corridor
o. dorm C
p. sanfac C
q. dorm D
r. sanfac D
s. mess corridor
t. mess hall
u. storage west.



# Adventurer's Realm

*by Michael Spiteri*

Welcome once again to Adventurers' Realm. Many apologies to those of you who had to wait weeks for a response to your letters, and apologies again for the reduced size of this month's Realm. It is all because I have moved into a new cave, and all the letters, programs, etc, are in boxes. Don't worry, things should be back to normal by March's Realm. Please note the new address as well!! This address is just temporary until I can get hold of a P.O. Box that will hold all your letters!!

The address to write to is:

**Adventurer's Realm**
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**or**

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Also, the VIATEL service is no longer available, and I apologise (again) if you have sent mail to my mailbox and received no response.

## CHARTS - CHARTS - CHARTS

### Australia's Top Ten Adventure/Strategy Games

1) LEATHER GODDESSES OF PHOBOS - Infocom
2) ASTERIX - Melbourne House
3) THE PAWN - Magnetic Scrolls/Rainbird
4) HITCHHIKER'S GUIDE TO THE GALAXY - Infocom
5) SILENT SERVICE - Microprose
6) LORD OF THE RINGS - Melbourne House
7) SECOND CITY (MERCENARY II) - Novagen
8) TRINITY - Infocom
9) ULTIMA IV - US Gold
10) ELITE - Firebird

*Don't forget to keep sending in your favourite adventures.*

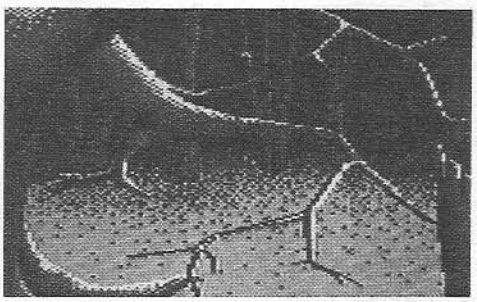
## New Releases

From the makers of *Borrowed Time,* comes *Tass Times,* a wacky adventure set in a town run by every animal under the sun. A land where your pet pooch is the famous canine reporter for the Tonetown Times! A supy zany graphic-animated adventure from Activision should be available by the time you read this.

Recently released is a game called *Dracula,* a graphic/text QUILLED adventure based on the famous novel by Bram Stoker. Great atmosphere, fair vocabulary, this game could prove to be quite popular. I am still in the early stages of the game, but I promise a complete review in one of the future issues of *The Australian Commodore Review.* Produced by the British firm CRL.

*The Pawn* is finally available in the shops for the Commodore 64. Just a few comments about the game: the graphics are incredible (and as close as possible to the Amiga version), the text descriptions are good, the vocabulary is not so good (....as the Infocom vocabs).

*Twice Shy* is the newest revolutionary program from the guys at Mosaic Publishing. Based on the book by Dick Francis, it is not only a graphic/text adventure game, but also a betting game, featuring animated graphics. Horse punters will love it!!!



Interceptor Software have been pretty quiet since the release of their *Heroes of Karn* adventure series a few years back. Now they have returned with a game that deals with surviving after a nuclear war. *After Shock* is a animated graphics/text adventure game, and should be available in Australia shortly.

# Problems

A dude called **SHOGUN II** is stuck in *Terrormolinos.* DOWN STEPS is the command required to climb down the steps, but how does he enter the taxi?

**Brad Ashwood** of Jindalee, QLD, wants to know how to get the herbs from the garden in *Macbeth*, and wants to know where he can find some skis in *Aztec Tomb - Revisited.*

Can anyone help **Tony Cupitt** and supply him with a list of spells for *Ultima IV (Quest of the Avatar)?*

**Craig McFurlane** is stuck in *Treasure Island.* Does anyone know how to get the drunken sailor away from the ship's wheel?

**Warren Romeo** wants to know if you can pass the bog near the spiders in *The Hobbit?*

**The Adventurer** is stuck in many adventures. In *Red Moon* he cannot cross the chasm. In *Never Ending Story* he cannot fly Falkor, even with the thing he wants, and finally, in *Himalayan Odyssey* where is the eye and what's the paint for?

**Sean** of Viatel 270561600 cannot enter the tunnel in *Never Ending Story* and cannot escape the trees in *Bored of the Rings.*

**Justin Prime** is stuck in *Colossal Caves.* How does he get the ring from the dragon and how does he get the pirate's chest from the vending machine? Also, in *Borrowed Time,* how can he get the paper from Lebock's house and what post box does he need to open?

**Dorothy Millard** of Croydon, Vic, is having trouble in *Circus Adventure.* She cannot use the petrol syphon. In *Jewels of Babylon,* how does she use the watch to get past the cannibals?

**Mrs Ellen Budden** solved most of the problems sent in by readers over the last couple of months (see further down), but she is also stuck in a few games. In *Skull Island,* cannibals are preventing her from leaving the place. In *King Solomon's Mines,* she has a canteen that empties itself. In *The Hobbit* she cannot find a key that fits in the small door in the mountainside. In *WarGames* she cannot get through the sliding doors. Finally, in *Castle of Terror* she cannot seem to find the flint.

**Nicholas Blair** is stuck in *Red Moon.* He cannot get past the room of flashing lights.

A Harpy (?) is preventing **Mark Sutton** from getting anywhere in *Catacombs.*

**Vivienne Slater** cannot avoid a sudden death with a shark in *Nine Princes in Amber,* and she wants to know how to defeat the Green Knight in *Lord of the Rings.*

**Jamie Kennon** is stuck in *Ballyhoo.* How does he get into the meeting in the trailer? How does he move the old plywood sideshow from the Menagerie Nook? And why is the cat hiding under the bed?

**Steven Suthers** (supplier of *Hunchback* map) is stuck in *Worm of Paradise.* Where can he find the valve?

**Ann Brownell** is stuck in *Robin of Sherwood.* Where is the silver arrow? How does she enter the castle? Where is the key to the castle door?

# Answers

**Ellen Budden** kindly sent in solutions to many of our readers' problems.

*Bastow Manor* (for **Michael Davis** and **Andrew Kidd**).

**Q.** How do you get into the study? **A.** You need the brass key.

**Q.** How do you open the door at the other end of the corridor? **A.** You dont. It's a red herring!

**Q.** What's inside the apple? **A.** It contains a small key which opens the small box which contains the combo.

*The Hobbit* (for **Ben Creek**).

**Q.** How do you escape the bulbous eyes? **A.** Wait twice before moving.

*Aztec Tomb* (for **Unknown adventurer**).

**Q.** How do you get the map? **A.** Exchange it for a cloak (see the gnome/elf in treehouse).

**Q.** How do you get up the cliff? **A.** When in boat next to cliff, JUMP OVER and SWIM and GO BEACH.

*WarGames* (for **James Elstob**)

**Q.** How do you get the shiny object? **A.** Wear the gasmask (found after sickbay).

**Q.** How do you escape from sickbay? **A.** You need scissors, screwdriver and gloves (worn). LEVER PANEL and then CUT WIRES. Scissors can be found under the pillow.

*Skull Island* (for **Steven Woolhouse**)

**Q.** How do you get off the beach? **A.** Go to lion rock, PACE 15, then DIG (with shell). LOOK and you'll find some ROPE. Tie rope to anchor.

*Murder on Waterfront* (for **Steven Woolhouse**)

**Q.** How do you order food from the restaurant? **A.** Try SIT TABLE, then ORDER MEAL (or FOOD).

**Q.** How do you get past the undertaker? **A.** You have to go through his back door.

*Hampstead* (for **Martin Trommer**)

**Q.** How do you get out of the complex? **A.** n.e.e.ne.e.e.ne.n.sw.

Meanwhile, **Dorothy Millard** lends a helping hand:

*Smuggler's Inn* (for **Di Vernon**)

**Q.** How do you operate the TRAPDOOR. **A.** TURN RING, then OPEN TRAPDOOR.

*ZORK I* (for **Andrew Kidd**)

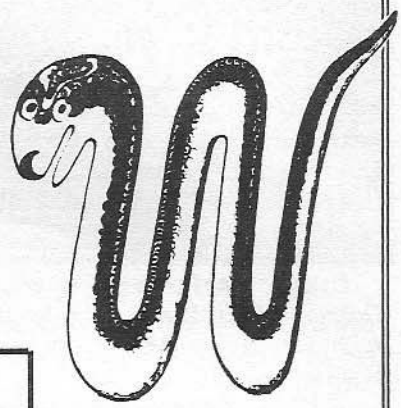
**Q.** Where is the garlic? **A.** In the sack in the kitchen.

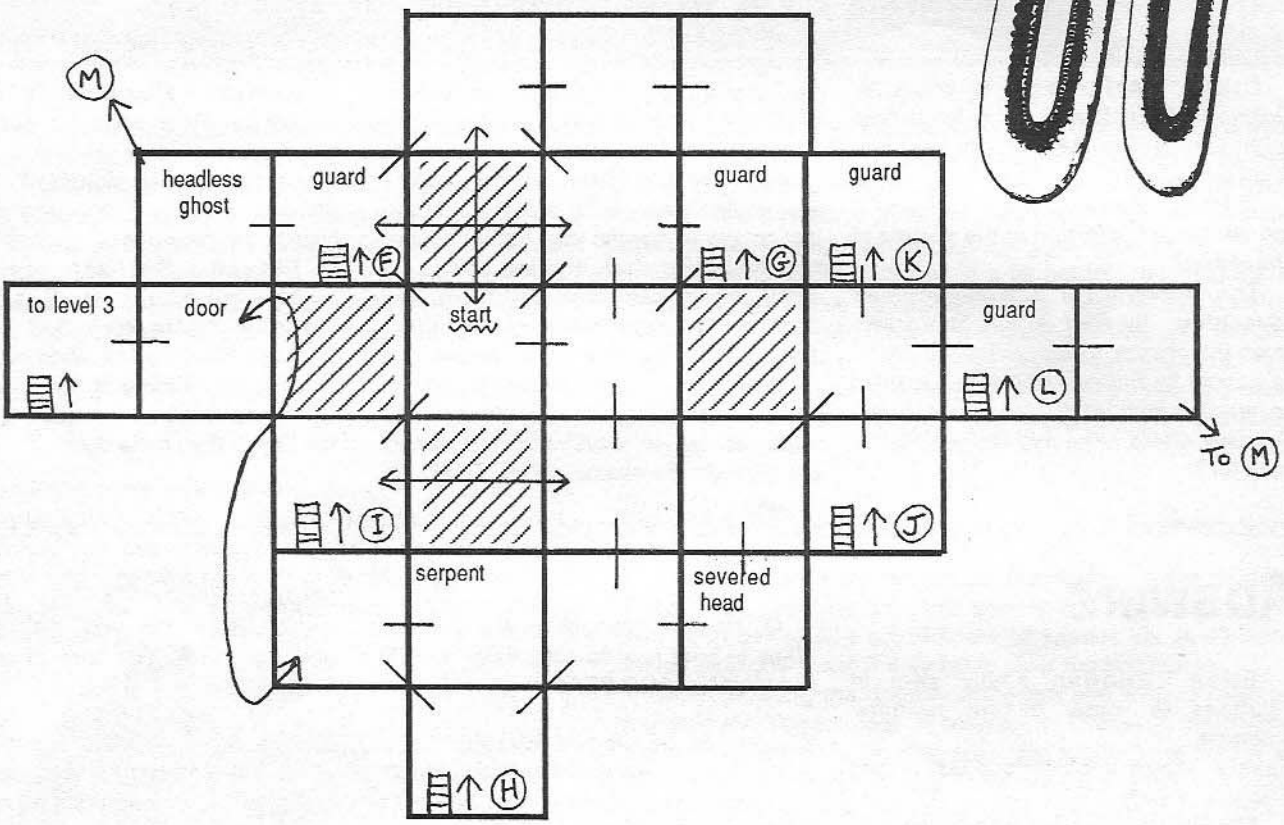
Thanks to all who offered help with the Garlic in *ZORK I.*

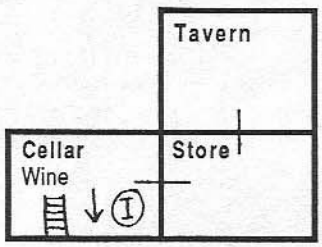
That's all for this month. I promise a much much bigger Realm in March.

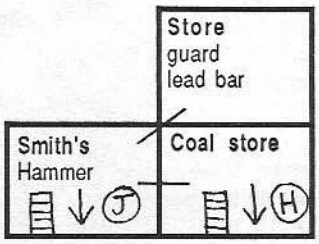
# The Sewers

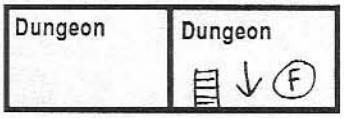
## Level 2



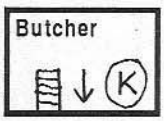


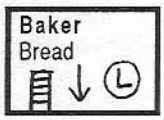




**Upstairs rooms.**
The letters next to the arrows correspond to the letters in the sewers.





# *Scribble! Version 2.00*

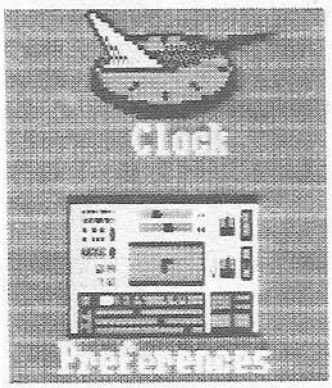
## *A good word processor for the Amiga*

*by Stephen Gordon and Shane Watts*

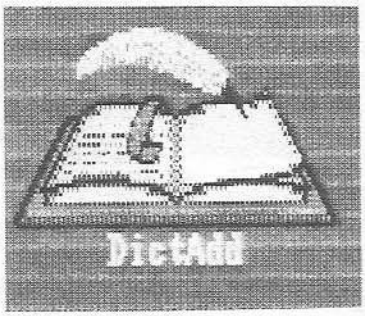
After using *WordCraft* on the PC-10 for over a year, it's interesting to start using different word processors. So when we got a chance to try out *Scribble!,* we were ready for a change. As is usual when changing programs it took a while to get used to the differences. In fact Shane is still trying to complete the transition.

After reading the small but generally complete manual and the documentation files on the disk, you can just jump in. If this is your first experience with a word processor you might want to go through the tutorial chapter. Be aware though, this is a really "basic" tutorial. If you have ever used any word processor before you can probably just skim this chapter. There are three files explaining **(1)** changes for this version (2.00), **(2)** the new Spell feature, and **(3)** the MailMerge feature. I have not used the earlier version but from the documentation it appears the changes are improvements.

*Scribble!* runs from either Workbench or CLI. Running from Workbench is rather pleasant since the designers of this program have provided some very nice ikons. Clicking on the *Scribble!* ikon loads the program and provides a full screen window to start entering text or load an existing document to edit. If you click on the Document drawer on the *Scribble!* system disk and click on one of the ikons in it, the existing document will be loaded with *Scribble!.* The creation of ikons for your documents is optional as are most of the features of *Scribble!.*

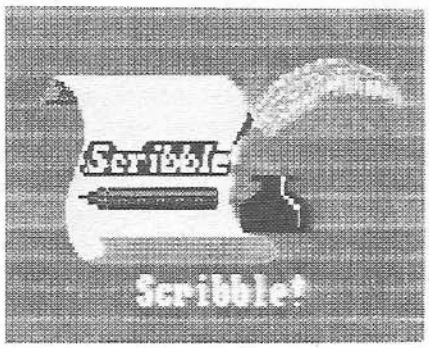



One of the options we really like is being able to select the paper and text colour from the screen colours set with Preferences. Being able to write in black or blue on a white background is more like typing on a sheet of paper. Okay,




some habits are hard to change. Practically any option that you prefer to the defaults may be changed and saved in a "Scribble!.fmt" file that will be loaded at startup time saving you from making several trivial option changes each time.

It is, I imagine, difficult to decide which tasks to assign to menus and which to the keyboard for a word processing program which is basically a keyboard task. Generally people can live with the decisions of the writers of *Scribble!* This is not a major problem for the user, since most of the menu options are available from the keyboard with either ALT, SHIFT or Amiga key combinations. In fact, the few not dually selectable are rarely used.




One new option is being able to use *WordStar* command-control key combinations. This is a help to Stephen as *WordCraft* also supports those combinations and he has become accustomed to using them.

The F1 key provides limited online help for the most used function. The F2 key provides a list of dot commands for page formatting. We really think the more obscure functions should be in the help screen, since the more used ones will be quickly memorized with use.

One important function is performed by the F4 key. It saves your document to its current disk file, providing easy protection from power problems.

A problem with these help screens is that they are not windows and therefore are not resizable or movable. You have to call them up each time you want them and then put them away before you can continue. Not too sophisticated. At least you can make them go away with the same keys that make them appear. There is optionally a requestor that you can click on.

This is a program of many modes, or "Actions", in *Scribble!* terminology. Each mode has a different pointer shape: **Edit** is a pencil, - looks like a stub to me. **Copy** is a camera, **Cut** a scissors,

Paste a glue brush, and **Style** a brush. All of these pointers, except the pencil, become a paint roller while you are selecting the text to be acted upon. Speaking of modes; Insert mode can be toggled on by ALT-I, and you are always in auto reformat mode. In other words when you insert some text in the middle of a paragraph the following text will be shifted accordingly. We like this though we are sure others will not.

The only problem we have had with the program concerns the way *Scribble!* delimits lines and paragraphs. Linefeeds are inserted only at the end of paragraphs. AmigaDOS delimits lines with linefeeds. Therefore if you try to read a *Scribble!* produced document into, say ED, it may fail because the lines are too long. Of couse you can press RETURN at the end of each line, which is okay, if you are editing program source code or other fixed format files.

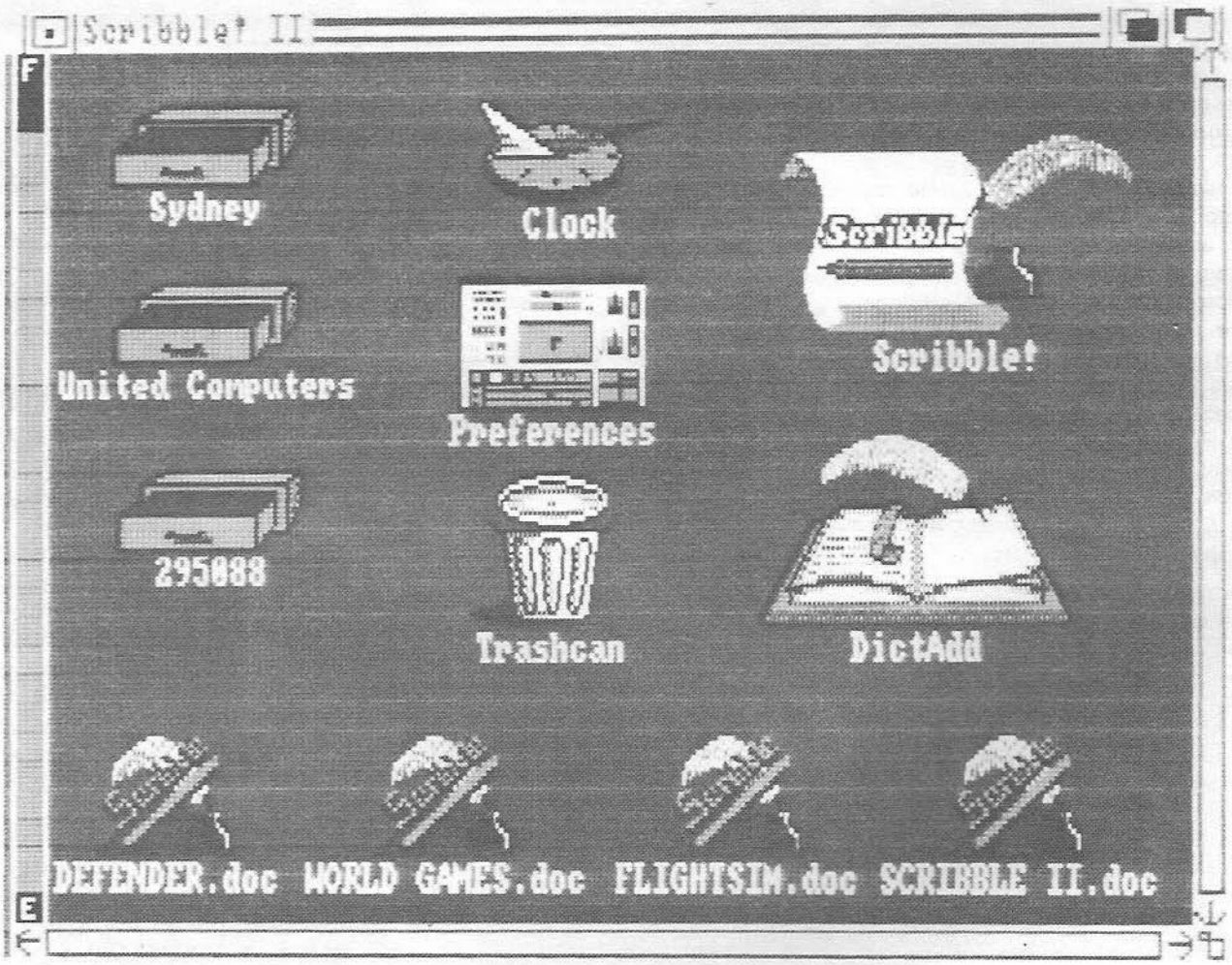
My problem occurs because the editor of *The Australian Commodore Review* uses ED to do some final touchup of articles and can't read *Scribble!* files directly. (Did you ever notice how many names of things relating to the Amiga have exclamation points in them?)

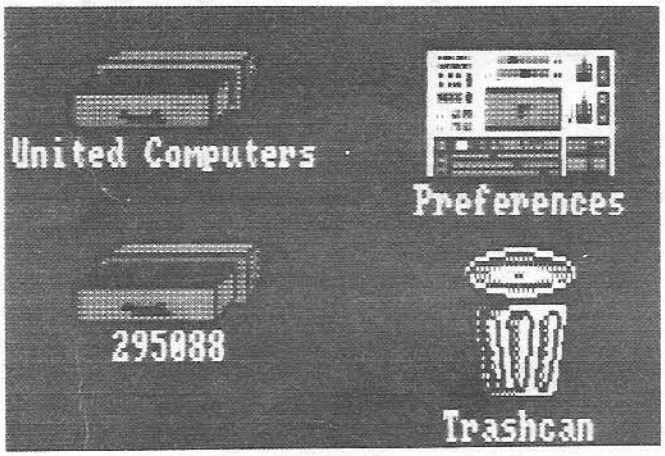
I have solved the problem with a public domain program called *TextFile-Converter* (TFC) written by Mark Allen and Ken Strange. TFC is an AmigaBASIC program that will truncate all lines in a file to your desired maximum length by inserting linefeeds and rewriting the file to a new file.

*Scribble!* loses its place now and then if you don't have the end of paragraph markers showing on the screen. When you type over one of these markers the following lines become part of the previous paragraph. Not a big problem but annoying. This really caused me some bother until I learned to turn them back on by the ALT-I toggle.

*Scribble!* has many useful features that allow quick retrieval and storage of documents. While listing a directory, you may enter a new device or directory name and *Scribble!* will immediately start to list the new directory. Neat! In fact you don't even have to wait for it to complete its listing. When you see the file you want, click on it, click on GET and it starts loading. Now that's response! The scroll gadget is active even while the directory is being displayed.

*Scribble!* runs under WorkBench 1.1 or 1.2. In fact some improvements are available only under WorkBench 1.2. When a requestor is put up under 1.2 it is not necessary to click on the string gadget before you start to enter the required text. Some requestors will accept the first letter of the answer from the keyboard rather than requiring a click of the mouse.






You may work in up to four different windows, on the same or different files. The default work space size is 16K. The documentation says it will load files of over 290K using dynamic file allocation. I don't have any documents that size - my ideas for a book are not quite ready yet - so I was unable to test this. It allows you to predetermine file size in case you have problems with its dynamic method.

The new Spell Check feature is very handy. It can be used on a word by word basis while you are entering text, for a window or for an entire document. Its dictionary is not the largest I've used - that's Webster's New World for the IBM PC - but it is expandable as you use it. Eventually it will learn all of the computer terms I use. It doesn't even recognize Amiga! Not that I would ever misspell it but it picked it out of a document scan.

*Scribble!* allows you to put its dictionary in ram for quicker response but when I did this and tried to edit another document I didn't have enough memory (I think 512K). Of course you lucky folks with ram expansion should not have this problem. Actually it isn't really necessary to do this because the disk reads are quite fast.

The window option is just a quick scan to show you potential errors. It doesn't let you fix any of them with this option.

By the way, the spell checker is not a window either. It's always the same size and in the same position. (It shows you the word you wanted checked and a few optional spellings to choose from.) It would be nice to have it avoid the area you are checking or at least be movable so you could see the context of the word in question.

Another gripe about the spell checker is that it is supposed to recognize the roots of words when used with other suffixes. Sometimes it does and sometimes it doesn't. "Predetermines" is in the dictionary but when I checked "predetermine" which I used in an earlier paragraph it didn't find it!?

For you folk just dying to start generating your own junk mail or just need to send form letters at Christmas to all of your relatives, *Scribble!* now has Mail Merge capabilities. You type your basic letter with embedded "variable names" with the format of &Name& wherever you need replacement. You then create a list of replacement values and save them in a file. The basic letter must contain dot commands to drive the process. For example: replacement values. You can also prompt the user for values as the letter is being typed by using .AV=Name. "Name" being the variable name used in the letter. It seems to have the necessary functionality.

*Scribble!* shares one problem with *Deluxe Paint* and *Deluxe Print.* The Amiga is a multitasking machine. Right? Well how come when these programs start a print task, it takes over? The print task should be a separate task so you can start working on something else or even the same document that's being printed. That's what it's all about. At least with *Scribble!* you can stop a print task if there is a problem. If you press the space bar it will pause the print and the escape key will abort the print. That is an improvement over the "Deluxe" one.

All in all I really like *Scribble!* It has some things to get used to but none to prevent it from being a useful program.

Program: Scribble! II
Machine: Amiga
Price: $249.00
Publisher: Micro-Systems Software.
Distributor: Oxford Systematics
Available at: Sydney United Computers.


## Cockroach Graphics Pirate

**The Cockroach Graphics Pirate is a transparent cartridge for use on the Commodore 64, SX64 and 128 in 64 mode.**

Any screen may be captured at the press of a button and saved to disk (including sprites and character sets). These files may be extensively edited using a powerful display editor supplied on disk or as the screens are conveniently saved as KOALA or DOODLE files, they may be loaded into these drawing programs. The sprite files are SPRITE MAGIC compatible and the character sets are ULTRAFONT compatible (public domain COMPUTE).

A ROACH-SHOW maker allows these screens to be compressed and compiled into a slide show which displays everything that was on the original screen including sprites. The Roach-Show incorporates an ultra-fast loader which will display a new screen approximately every 4 seconds without blanking. This is fast enough to allow crude animation!

Any screen displayed may be printed out (including sprites) using the software supplied on disk. The disk will be updated periodically to include as many printers as possible.

Unlike many HI-RES dump cartridges which only give you one shot at a hard copy of your screen, this one allows you to save your screen to disk for subsequent editing and printing. Many other utilities included on disk for interfacing with PRINTSHOP, PRINT MASTER, NEWSROOM, etc.

**Price: $59.95 (including postage)**
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For more details send stamped, self-addressed envelope to:
**Cockroach Software, PO Box 1154,**
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# Controlling your Joystick

So you're a games designer. And you can't get your one eyed, two tailed, three headed, six footed slug to move by joystick control. The answer is really rather simple. Just follow my leads here, and your slug will be moving in no time.

First you must decide which joystick port your game is going to operate on. For a game, or any other application, which is written entirely or partly in BASIC, I advise that you use Port #2. The reason is because a joystick in Port #1 reproduces values which are the same as some keys. If you place your joystick in Port #1 and move it around you will notice garbage appearing on the screen. That means Port #1 is a NO - NO! This leaves us with Port #2.

Okay. Plug your joystick into Port 2, and let's get to business.

The first thing you should know is that both joysticks have a register which holds their values.

JOYSTICK PORT #1. - 56321
JOYSTICK PORT #2. - 56320

These are the memory locations that return the joystick value. The value that I'm talking about is nothing more than a number. You see the joystick registers are updated every 60th of a second. (That's once every interrupt).

The joystick direction is determined, and BITs within these BYTEs are set according to the direction. So when we take a look at the contents of these memory locations, we see a decimal number. If the joystick changes direction, the number changes with it. Try typing in this one liner.

```
10 PRINTPEEK(56320):GOTO10
```

RUN the program. You should see a stream of numbers flow up the screen. Try moving your joystick, the numbers change with the joystick.

Before we go any further, we should write down what numbers equal what directions. No problems, I've already done it for you. Look below.

JOYSTICK PORT #2.
MEMORY LOCATION - 56320

| With the Fire Button | Without the Fire Button |
|---|---|
| UP - 110 | UP - 126 |
| DOWN - 109 | DOWN - 125 |
| LEFT - 107 | LEFT - 123 |
| RIGHT - 103 | RIGHT - 119 |
| UP & LEFT - 106 | UP & LEFT - 122 |
| DOWN & LEFT - 105 | DOWN & LEFT - 121 |
| DOWN & RIGHT - 101 | DOWN & RIGHT - 117 |
| UP & RIGHT - 102 | UP & RIGHT - 118 |
| NONE - 111 | NONE - 127 |

So now that we know what values represent what directions, we can get somewhere. If you are going to move an object by joystick, all you have to do is:

**(A)** Read the value within the memory location.
**(B)** Check the value with a number. eg 110
**(C)** If the value is 110, then go to our 'UP' routine.

Of course we will have to check for many different numbers, so as to get all of the directions. This may sound rather difficult, but it's not. If you type in the following program, you should gain a better knowledge of it all.

```
10 PRINT"[CLR]":JOY=56320
15 A=1522:POKEA,160
20 IFPEEK(JOY)=119THEN100:REM JOYSTICK IN RIGHT
       POSITION
30 IFPEEK(JOY)=123THEN200:REM JOYSTICK IN LEFT
       POSITION
40 IFPEEK(JOY)=125THEN300:REM JOYSTICK IN DOWN
       POSITION
50 IFPEEK(JOY)=126THEN400:REM JOYSTICK IN UP
       POSITION
60 GOTO20
100 REM *** MOVE RIGHT ***
110 POKEA,32:A=A+1:IFA>2023THENA=A-1
120 POKEA,160:GOTO20
200 REM *** MOVE LEFT ***
210 POKEA,32:A=A-1:IFA<1024THENA=A+1
220 POKEA,160:GOTO20
300 REM *** MOVE DOWN ***
310 POKEA,32:A=A+40:IFA>2023THENA=A-40
320 POKEA,160:GOTO20
400 REM *** MOVE UP ***
410 POKEA,32:A=A-40:IFA<1024THENA=A+40
420 POKEA,160:GOTO20
```

The above program contains REMs to show you what each part does. Take note of the values being checked, as to the values in the table. So this is all there is to the joystick - checking numbers, and moving objects to match the numbers. However, it isn't quite that simple.

What if you want your object to move on an angle, with the fire button having a function. It's true that this can be done from BASIC, just a matter of checking all 18 directions. This isn't very practical though. For starters, you'd get lost in numbers and different direction routines.

Then there's the problem of the speed of BASIC. CBM BASIC is the tortoise that lost to the hare six times over. The only way that we are going to get the full amount of work from our joystick is with Machine Code. What!! You don't understand Machine Code. Okay, I can handle this, I've done up a mean little program for you. Type it in, and save it to disk, or cassette, before running.

```
10 PRINT"[CLR][6*RHT]LOADING DATA.  PLEASE WAIT!"
20 FORI=49152TO49262:READA:CH=CH+A:POKEI,A:NEXT
30 IFCH<>11213THENPRINT"[CLR]ERROR IN DATA
    STATEMENTS":END
40 PRINT"CORRECT DATA..SYS49152 TO CALL
    JOYSTICK":NEW
100 DATA169,0,141,167,2,141,168,2,141,169,2,
    141,170,2,141,171
110 DATA2,173,0,220,73,127,41,1,201,1,240,45,
    173,0,220,73
120 DATA127,41,2,201,2,240,42,173,0,220,73,
    127,41,4,201,4
130 DATA240,39,173,0,220,73,127,41,8,201,8,240,
    36,173,0,220
140 DATA73,127,41,16,201,16,240,33,96,169,1,141,
    167,2,76,28
150 DATA192,169,1,141,168,2,76,39,192,169,1,141,169,
    2,76,50
160 DATA192,169,1,141,170,2,76,61,192,169,1,
    141,171,2,96
```

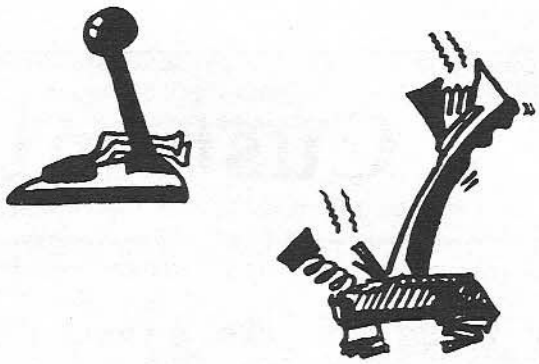
Once you have saved it to disk or cassette, type RUN [RETURN]. The screen will clear and display the 'Loading Data' message. There should be a small pause. Not too long after RUNning, you get one of two messages. If you get the 'Error in Data' you will have to check your DATA statements, otherwise you're okay.

Now then, what does this program do? Put simply, it reads any combination of joystick directions possible. (Joystick in Port #2.) I have made it as small as possible so that you can tag it onto your own programs. The way that it works is like this. On typing SYS49152 [RETURN], there are five memory locations affected. There is a memory location for each direction, UP, DOWN, LEFT, RIGHT and for FIRE. These locations are:-

| MEMORY ADDRESS | DIRECTION |
|---|---|
| 679 | UP |
| 680 | DOWN |
| 681 | LEFT |
| 682 | RIGHT |
| 683 | FIRE |

These addresses are either set to 0 or 1. 1 stands for YES, and 0 for NO. So if you place your joystick in the position between UP and RIGHT, memory locations 679 and 682 will be set to 1. The rest will be set to 0. To demonstrate this further, type in the small example below.

```
10 PRINT"[CLR][1*UP]UP    DOWN    LEFT    RIGHT    FIRE"
20 SYS49152
30 PRINT"[HME][1*DWN]"PEEK(679);"     ";PEEK(680);"
';PEEK(681);"
   ";PEEK(682);
   40 PRINT"     ";PEEK(683):GOTO20
```



This program gives you a visual display of what directions are being used. Try pushing the fire button while moving up. You see any, and I do mean 'ANY', combination can be used with this routine. You may be wondering how we are going to use this in a practical way. After all, we are still only given five directions, not the full 18. Or are we?

If you think about it, we only have to check five directions to get all 18. This is demonstrated below.

```
10 PRINT"[CLR]":V=53248:FORI=0TO63:POKE832+I,
    255:NEXT
20 X=100:Y=100:POKEV,100:POKEV+1,100:
    POKE2040,13:POKEV+21,1
30 SYS49152
40 IFPEEK(679)=1THENGOSUB100:REM UP
50 IFPEEK(680)=1THENGOSUB200:REM DOWN
60 IFPEEK(681)=1THENGOSUB300:REM LEFT
70 IFPEEK(682)=1THENGOSUB400:REM RIGHT
80 IFPEEK(683)=1THENGOSUB500:REM FIRE
90 GOTO30
100 Y=Y-1:IFY=50THENY=Y+1
110 POKEV+1,Y:RETURN
200 Y=Y+1:IFY=228THENY=Y-1
210 POKEV+1,Y:RETURN
300 X=X-1:IFX=25THRNX=X+1
310 POEKV,X:RETURN
400 X=X+1:IFX=256THENX=X-1
410 POKEV,X:RETURN
500 A=PEEK(V+39):A=A+1:IFA=256THENA=0
510 POKEV+39,A:RETURN
```

Before you RUN this program, be sure that you have already placed the Machine Code joystick reader into memory. If you have, which you should have, then away you go.

When the sprite appears on the screen try moving it in any direction. 45 degree angle, either UP or DOWN, to LEFT or RIGHT. Try pressing the fire button. The sprite changes colour. Try moving and firing at the same time. If you jump to your routines using GOSUB, then RETURN back. All directions are scanned, and carried out.

As I mentioned above, I've made the joystick routine as compact as they come. This will allow you to easily tag it onto your own programs for use.

Well, that's all there is to the humble joystick. Happy joysticking.

# Customised ROMS

*How would you like a new degree of user friendliness? How about the computer displaying 'WELL!!' instead of 'READY.' Or 'Another typo!' instead of SYNTAX ERROR.* ***Jason Briggs*** *explains how.*

Yes, you can do it if you want, there's no real difficulty in it. All of the above messages are held within your BASIC rom, and are quite easily changed. The KERNAL rom is a little different, but it to can be customized for your own particular taste.

## The Basic ROM

Now then, many of you may be wondering how we are going to change the ROMs. After all, both are Read Only Memory. And under normal conditions, POKEing won't have any effect. The secret is this, the Roms won't be in normal condition. In fact, they won't even be Roms any more, they'll be Ram. Not a bad trick, eh!! And the great part of it all is that it's so simple, that even I can understand it. That must be simple.

First of all you'll need to understand the following demo program. It may do you some good to type it in too, just so that you can see what's going on.

```
10 FORI=40960TO49151:POKEI,
PEEK(I):NEXT
20 POKE1,PEEK(1)AND254
```

Let's look at these lines. Firstly line 10. To most people this would appear to be doing lots of nothing. But that's where most people are wrong, this line does do a lot. What's happening is this. Inside your C64 (or C64c) there are plenty over Video Banks. In fact your 64 has well of 64k, it wouldn't be an overstatement to say that it has 100s of K. There's only one problem, the machine can only access 64K at one time. Bit of a let down, or is it?

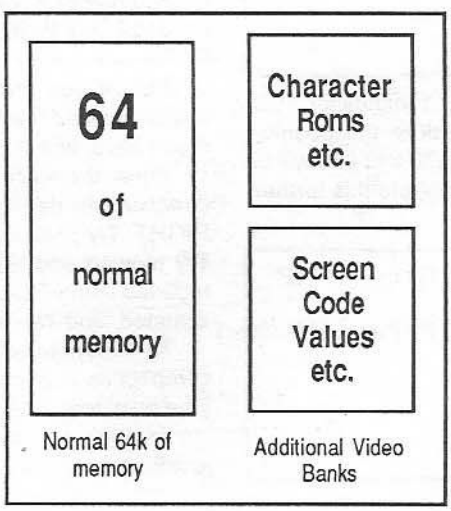
These Video Banks can be used to store extra information. Then when you need this information, you simply switch out the first Video bank, and replace it with a new Video bank. So when line 10 POKEs into Rom the computer places that value not into the ROM, but into the Video Bank which will be its replacement.

And that's the job of line 20, it simply swaps the Video Banks around. One question that may arise is, why bother with line 10? And the answer is quite easy to understand. If we don't transfer our BASIC rom into the second Video Bank before swapping them, our computer won't have a BASIC, and that would cause a Crash!! (However it should be noted, that if you're using a machine code program which doesn't use BASIC, then your Basic memory can be used as ram.)

Now run the above demo program. After a small pause, the 'READY.' prompt should be displayed. At first it seems that nothing has changed, but I can assure you a lot has changed. Try POKE41853,33, you should notice that the full stop in the READY message has changed to a '!' sign. By transferring the BASIC rom, and switching Video Banks, we have in effect changed the BASIC rom into BASIC ram.

This is all very fine, but what is the use behind it? Well, for starters, you can create your very own version of BASIC. To the more advanced Machine Code programmer it means being able to change and make new BASIC commands.

```
.:A364 0D 4F 4B 0D 00 20 20 45
.:A36C 52 52 4F 52 00 20 49 4E
.:A374 20 00 0D 0A 52 45 41 44
.:A37C 59 2E 0D 0A 00 0D 0A 42
.:A384 52 45 41 4B 00 A0 BA E8
```




Before you can do either of these things you have to know where the messages are stored in memory. And it just so happens that I've given you a memory display of where the keywords and messages are stored.

All of the numbers used in these displays are Hexadecimal. So if you're going to change your Rom from Basic, you'll have to convert these memory locations into decimal. I must also tell you that the ASCII values for new characters have to be used.

Up until now I've only been talking about cosmetic changes, like changing

FOR to FER, and NEXT to NERD. But there are some very handy things that you can do.

For example, everybody knows that if you enter the command PRINTASC(""), the computer will return with ?ILLEGAL QUANTITY ERROR. This can be quite a snag if you're trying to read a response from an INPUT command. There's always somebody out there who'll just press return.

But it is possible to fix them up with a custom rom. If you have your custom rom in memory try typing in this: POKE46991,5. Then try PRINTASC(""), please note that the computer doesn't return an error. Instead you get the value zero. This is only one practical example of what this technique can do. After all you can alter existing Basic routines and even create new ones. All by using this idea.

For the most part this is a topic which is left up to you. It's really a matter of your own personal choice. But before I let you go and terrorize your poor computer, there are a few very important things that you need to know.

In a normal situation, if you were to hit RUNSTOP/RESTORE keys together, it would result in the computer returning to the default Video Bank, and destroying your new Rom. However you can rest easy, because below I have supplied you with a demo program. My program doesn't do much, but it does have two very handy machine code programs in it.

The first lot of data that you will see is a transfer program. The second piece of data is a machine code program that will handle the RESTORE key. I'm telling you this so that you can use them in your own programs.

But there a few things that you'll need to know. The transfer program must always be located at 49152 ($C000). When you type SYS49152, there should be a little pause of around half a second. Then the normal 'READY' prompt will appear. This will mean that your Basic Rom has been transferred.

The RESTORE routine is for the most part relocatable, the only problem that you have to redirect the NMI interrupt routine. (The pointers to this are at 792 and 793). If you can't understand how to work out Hi byte, Lo byte format, then

```
. :A09E 45 4E C4 46 4F D2 4E 45
. :A0A6 58 D4 44 41 54 C1 49 4E
. :A0AE 50 55 54 A3 49 4E 50 55
. :A0B6 D4 44 49 CD 52 45 41 C4
. :A0BE 4C 45 D4 47 4F 54 CF 52
. :A0C6 55 CE 49 C6 52 45 53 54
. :A0CE 4F 52 C5 47 4F 53 55 C2
. :A0D6 52 45 54 55 52 CE 52 45
. :A0DE CD 53 54 4F D0 4F CE 57
. :A0E6 41 49 D4 4C 4F 41 C4 53
. :A0EE 41 56 C5 56 45 52 49 46
. :A0F6 D9 44 45 C6 50 4F 4B C5
. :A0FE 50 52 49 4E 54 A3 50 52
. :A106 49 4E D4 43 4F 4E D4 4C
. :A10E 49 53 D4 43 4C D2 43 4D
. :A116 C4 53 59 D3 4F 50 45 CE
. :A11E 43 4C 4F 53 C5 47 45 D4
. :A126 4E 45 D7 54 41 42 A8 54
. :A12E CF 46 CE 53 50 43 A8 54
. :A136 48 45 CE 4E 4F D4 53 54
. :A13E 45 D0 A8 AD AA AF DE 41
. :A146 4E C4 4F D2 BE BD BC 53
. :A14E 47 CE 49 4E D4 41 42 D3
. :A156 55 53 D2 46 52 C5 50 4F
. :A15E D3 53 51 D2 52 4E C4 4C
. :A166 4F C7 45 58 D0 43 4F D3
. :A16E 53 49 CE 54 41 CE 41 54
. :A176 CE 50 45 45 CB 4C 45 CE
. :A17E 53 54 52 A4 56 41 CC 41
. :A186 53 C3 43 48 52 A4 4C 45
. :A18E 46 54 A4 52 49 47 48 54
. :A196 A4 4D 49 44 A4 47 CF 00
. :A19E 54 4F 4F 20 4D 41 4E 59
. :A1A6 20 46 49 4C 45 D3 46 49
. :A1AE 4C 45 20 4F 50 45 CE 46
. :A1B6 49 4C 45 20 4E 4F 54 20
. :A1BE 4F 50 45 CE 46 49 4C 45
. :A1C6 20 4E 4F 54 20 46 4F 55
. :A1CE 4E C4 44 45 56 49 43 45
. :A1D6 20 4E 4F 54 20 50 52 45
. :A1DE 53 45 4E D4 4E 4F 54 20
. :A1E6 49 4E 50 55 54 20 46 49
. :A1EE 4C C5 4E 4F 54 20 4F 55
. :A1F6 54 50 55 54 20 46 49 4C
. :A1FE C5 4D 49 53 53 49 4E 47
. :A206 20 46 49 4C 45 20 4E 41
. :A20E 4D C5 49 4C 4C 45 47 41
. :A216 4C 20 44 45 56 49 43 45
. :A21E 20 4E 55 4D 42 45 D2 4E
. :A226 45 58 54 20 57 49 54 48
. :A22E 4F 55 54 20 46 4F D2 53
. :A236 59 4E 54 41 D8 52 45 54
. :A23E 55 52 4E 20 57 49 54 48
. :A246 4F 55 54 20 47 4F 53 55
. :A24E C2 4F 55 54 20 4F 46 20
. :A256 44 41 54 C1 49 4C 4C 45
. :A25E 47 41 4C 20 51 55 41 4E
. :A266 54 49 54 D9 4F 56 45 52
. :A26E 46 4C 4F D7 4F 55 54 20
. :A276 4F 46 20 4D 45 4D 4F 52
. :A27E D9 55 4E 44 45 46 27 44
. :A286 20 53 54 41 54 45 4D 45
. :A28E 4E D4 42 41 44 20 53 55
. :A296 42 53 43 52 49 50 D4 52
. :A29E 45 44 49 4D 27 44 20 41
. :A2A6 52 52 41 D9 44 49 56 49
. :A2AE 53 49 4F 4E 20 42 59 20
. :A2B6 5A 45 52 CF 49 4C 4C 45
```

forget it! If you don't understand what I mean then you won't really want to relocate it anyway. Just keep its starting address at 48978. To boot up this routine just use the commands: POKE792,82:POKE793,191

That about wraps it up. It's really up to you from here on in. I've given you the basics, you could start by changing the Basic commands. Or you could write your own Basic.

I do however have a few words of warning about the following demo program. Firstly, if you are going to use spaces, use the Shift/Space combination. Your new prompt must be exactly the length given on the screen.

And last but not least, because this program uses the RESTORE key routine, it will mean that the only way for you to exit your customized rom, will be with these commands. POKE1,PEEK(1)OR1. All that does is switch the old Video Bank back in. (In other words turns the Basic back into Rom).

Well, I've given you the booster that you need. Now it's up to you. Have fun!!

```
.:A2BE 47 41 4C 20 44 49 52 45
.:A2C6 43 D4 54 59 50 45 20 4D
.:A2CE 49 53 4D 41 54 43 C8 53
.:A2D6 54 52 49 4E 47 20 54 4F
.:A2DE 4F 20 4C 4F 4E C7 46 49
.:A2E6 4C 45 20 44 41 54 C1 46
.:A2EE 4F 52 4D 55 4C 41 20 54
.:A2F6 4F 4F 20 43 4F 4D 50 4C
.:A2FE 45 D8 43 41 4E 27 54 20
.:A306 43 4F 4E 54 49 4E 55 C5
.:A30E 55 4E 44 45 46 27 44 20
.:A316 46 55 4E 43 54 49 4F CE
.:A31E 56 45 52 49 46 D9 4C 4F
.:A326 41 C4 9E A1 AC A1 B5 A1
```

```
0 REM ********************************
0 REM *     CUSTOMIZE ROM PROGRAM    *
0 REM *    (C) 1986  JASON BRIGGS    *
0 REM *                              *
0 REM * ALLOWS YOU TO CUSTOMIZE YOUR *
0 REM *    COMMODORE 64 BASIC ROM    *
0 REM ********************************
0 FORI=49152TO49199:READA:POKEI,A:NEXT:SYS49152:POKE1,PEEK(1)AND254
0 FORI=48978TO48998:READA:POKEI,A:NEXT:GOTO140
00 PRINT"[CLR]":POKE250,255:PRINTSPC(10)"[UP↑]CUSTOMIZED BASIC ROM"
10 PRINTSPC(10)"──────────────────":PRINTSPC(12)"[DWN]BY JASON BRIGGS"
20 PRINTSPC(12)"──────────────────"
30 PRINTSPC(15)"[DWN]LENGTH:"M:RETURN
40 M=6:GOSUB100:INPUT"[2*DWN]ENTER NEW 'READY.' PROMPT";A$:LE=LEN(A$):SA=41847
50 IFLE>6THEN140
60 IFLE<6THEN140
70 GOSUB490
80 M=5:GOSUB100:INPUT"[2*DWN]ENTER NEW 'BREAK' PROMPT";A$:LE=LEN(A$):SA=41858
90 IFLE<5THEN180
00 IFLE>5THEN180
10 GOSUB490
20 M=7:GOSUB100:INPUT"[2*DWN]ENTER NEW '  ERROR' PROMPT";A$:LE=LEN(A$):SA=41832
30 IFLE<7THEN220
40 IFLE>7THEN220
50 GOSUB490
60 M=4:GOSUB100:INPUT"[2*DWN]ENTER NEW ' IN ' PROMPT";A$:LE=LEN(A$):SA=41840
70 IFLE<4THEN260
80 IFLE>4THEN260
90 GOSUB490
00 M=2:GOSUB100:INPUT"[2*DWN]ENTER NEW 'OK' PROMPT";A$:LE=LEN(A$):SA=41828
10 IFLE<2THEN300
20 IFLE>2THEN300
30 GOSUB490
40 M=13:GOSUB100:INPUT"[2*DWN]ENTER NEW 'FILE NOT FOUND' MESSAGE";A$:LE=LEN(A$)
50 SA=41409:IFLE<13THEN340
60 IFLE>13THEN340
70 GOSUB490:POKESA+14,160
80 M=17:GOSUB100:INPUT"[2*DWN]ENTER NEW 'DEVICE NOT PRESENT' MESSAGE";A$:LE=LEN
A$)
90 SA=41423:IFLE<17THEN380
00 IFLE>17THEN380
10 GOSUB490:POKESA+18,160
20 M=14:GOSUB100:INPUT"[2*DWN]DEFAULT COLOUR OF BORDER";A:IFA>15THEN420
30 IFA<0THEN420
40 M=3:GOSUB100:INPUT"[2*DWN]DEFAULT COLOUR OF SCREEN";B:IFB>15THEN440
50 IFB<0THEN440
60 M=6:GOSUB100:INPUT"[2*DWN]DEFAULT COLOUR OF CURSOR";C:IFC>15THEN460
70 IFC<0THEN460
80 POKE48979,A:POKE48984,B:POKE48989,C:POKE792,82:POKE793,191:END
90 FORTE=1TOLE:B$=MID$(A$,TE,1):C=ASC(B$):POKESA+TE,C:NEXT:RETURN
00 REM *** MACHINE CODE TRANSFER ****
10 DATA162,0,160,160,134,251,132,252,134,253,160,255,200,177,251,145
20 DATA251,192,255,208,247,166,253,224,32,240,20,232,134,253,24,165
30 DATA251,105,255,133,251,144,227,166,252,232,134,252,76,10,192,96
40 REM *** MACHINE CODE RESTORE ****
50 DATA169,14,141,32,208,169,3,141,33,208,169,6,141,134,2,32,68,229,76,116
50 DATA164
```

# Dealer Directory

## Cockroach Turbo-Rom

**Price: $42** (inc. postage etc.) Speed up program loading and saving with TURBO-ROM, available for C64, SX, 128, 1541, 1570/1. Works with 1 or 2 Drives. Vic switch compatible. Does not tie up cartridge socket. Works with printer connected. (Some fast loaders don't).

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---

## The Sultan's Palace

**Commodore 64/128**

The $1000.00 Reward for completing *Sultan's Palace* has been claimed by Chris Hamilton of Wangi-Wangi, NSW.

"Even though the reward has gone I am convinced by the tremendous feedback I have had about the program that it will continue to do well and provide many happy hours of Adventuring to all those who (like myself) love playing Adventure/Arcade games."

Price has now been discounted to $19.95 and the game is available from:

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**Emu Plains, NSW 2750.**

---

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**COMMODORE 64**

# Oscilloscope

*by Kyle Arnold*

*Oscilloscope will quite simply turn your 64 into an oscilloscope, that will produce static displays of waveforms from one cycle per second to at least 10 thousand cycles per second.*

The program itself is pretty straightforward. All you have to do is follow the prompts. When the program is first run, you will be asked to stand by while the machine code routines that handle the hires graphics and sound sampler are loaded into memory.

Then you will get the title screen (very simple) asking you for the speed number. This can be any number from 1 to 255, which actually allows you to adjust the band width of your digital Oscilloscope. Where numbers around five are for frequencies 500 cycles per second and higher, and numbers around 100 and up are for the very low frequencies. You may decide after a bit of experimenting which numbers best suit the frequencies you wish to display.

After you have entered the Speed number you will then be asked to press the space bar to continue. This will allow you time to properly set up your sound source. This is plugged into joy.port one via an adapter which you have to construct. As the circuit diagram shows it is very simple, and how you set it up is entirely up to you.

The parts - one 150K resistor and one audio transformer (1K/8 ohm) are available in any store that sells electronics parts. The connector to the joy port however, I have found a little difficult to find, but I found the connector and lead of an old joystick quite suitable. As the 64 does not have a sensitive input you do require the use of an amplifier for your sound source. I have found that a cassette recorder was quite suitable for this purpose. For testing, the sound from a tranny radio was quite adequate.

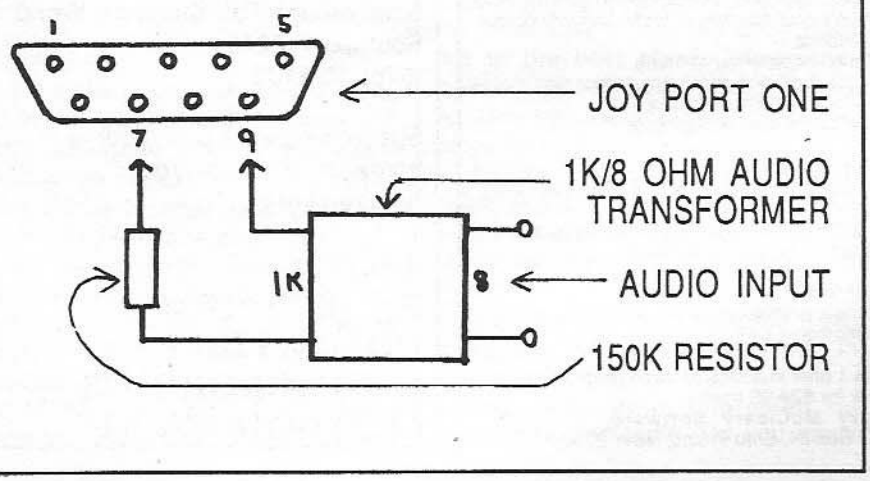
If everything is okay press the space bar and stand by while the program does the rest. The boarder will change colour indicating what is happening, RED-sound sampler is active: Purple-Program is computing the data: Grey-Program is creating the display: Green-Display is complete.

When the display is completed, the program halts until you press a key. Pressing any key will prompt the program to ask you if you wish a printout (try that on a real oscilloscope). The Printout, should you choose one, will be printed out on a 1520 printer plotter.

When all is done you will be taken back to the beginning of the program to sample more sounds or maybe adjust the settings until you have it right for the particular sound source you are trying to display.

A few things to note before I finish, however, are as follows: You will note that the display is a little below the centre of the screen. This is so, to produce an accurate display. Make sure you only have the two connections to the joy port as other connections can cause the program to halt. For best results use a single 150K/8 ohm transformer without the resistor, but as these transformers are pretty rare the present circuit will do the job very well.

**Circuit of C64 Oscilloscope Adapter.**



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```
10 REM ** DIGITAL  OSCILLOSCOPE  **
20 REM         KYLE ARNOLD       1984
30 REM           UPDATED         1986/7
40 :
50 PRINT"■           STAND BY"
60 DIMY(500):GOSUB410
70 POKE53281,1:POKE53280,6
80 PRINT"□■■ D I G I T A L  O S C I L L O S C O P E"
90 PRINT"■   WRITTEN BY  KYLE ARNOLD   1987"
100 PRINT"■■ CONNECT INPUT TO CONTROL PORT NO 1"
110 INPUT"■ ENTER SPEED NUMBER. 1 TO 255; ";SN:IFSN<1ORSN>255THEN80
120 POKE49998,SN
130 PRINT"■          PRESS SPACE BAR":LL=50000
140 GETA$:IFA$<>" "THEN140
150 PRINT"■■■■■                          OK !"
160 REM*SOURCE SOUND AND CREATE DISPLAY*
170 POKE53280,2:SYS49152:POKE53280,4
180 FORJ=0TO478:Y(J)=PEEK(LL+J):NEXT:POKE53280,15:Y1=Y(0)
190 SYS51200
200 FORX=0TO319:X%=X/256:Y%=X-(X%*256):POKE251,Y%:POKE252,X%
210 POKE253,Y(X):SYS51312
220 IFY(X)>Y1THEN630
230 IFY(X)<Y1THEN640
240 Y1=Y(X):NEXT
250 REM*PRESS ANY KEY HERE TO CONTINUE*
260 POKE53280,5
270 GE[illegible]:IF[illegible]"THEN270
280 POKE53272,PEEK(53272)AND247:POKE53265,PEEK(53265)AND223
290 PRINT"□■■■  DO YOU WANT A PRINTOUT ??"
300 POKE198,0
310 GETDD$:IFDD$=""THEN310
320 IFDD$="Y"THENPRINT"□":GOTO350
330 IFDD$="N"THENPRINT"□":GOTO400
340 GOTO310
350 OPEN1,6:OPEN2,6,1:POKE53280,15
360 FORX=0TO478:PRINT#2,"D",X,-Y(X):NEXT
370 PRINT#2,"H"
380 FORGG=1TO18:PRINT#1:NEXT
390 CLOSE1:CLOSE2
400 GOTO70
410 FORL=0TO2:CX=0:FORD=0TO15:READA:CX=CX+A:POKE49152+L*16+D,A:NEXTD
420 READA:IFA<>CXTHENPRINT"ERROR IN LINE";440+(L*10):STOP
430 NEXTL:GOTO470
440 DATA162,0,173,25,212,157,80,195,172,78,195,136,208,253,232,224,2502
450 DATA255,208,239,162,0,173,25,212,157,79,196,172,78,195,136,208,2495
460 DATA253,232,224,224,208,239,96,255,255,255,255,255,255,255,255,255,3771
470 FORL=0TO4:CX=0:FORD=0TO15:READA:CX=CX+A:POKE51200+L*16+D,A:NEXTD
480 READA:IFA<>CXTHENPRINT"ERROR IN LINE";500 +(L*10):STOP
490 NEXTL:GOTO550
500 DATA173,24,208,9,8,141,24,208,173,17,208,9,32,141,17,208,1600
510 DATA169,32,133,93,169,0,133,92,162,31,160,0,145,92,136,208,1755
520 DATA251,230,93,202,208,244,160,63,145,92,136,16,251,169,0,133,2393
530 DATA92,169,4,133,93,169,1,162,3,160,0,145,92,136,208,251,1818
540 DATA230,93,202,208,244,145,92,160,231,145,92,136,208,251,96,0,2533
550 FORL=0TO4:CX=0:FORD=0TO15:READA:CX=CX+A:POKE51312+L*16+D,A:NEXTD
560 READA:IFA<>CXTHENPRINT"ERROR IN LINE";580 +(L*10):STOP
570 NEXTL:RETURN
580 DATA165,251,41,7,170,56,169,0,133,90,106,202,16,252,133,89,1880
590 DATA165,251,41,248,133,92,165,253,74,74,74,133,91,74,102,90,2060
600 DATA74,102,90,101,91,133,91,165,253,41,7,101,90,101,92,133,1665
610 DATA90,165,91,101,252,101,255,133,91,160,0,177,90,5,89,145,1945
620 DATA90,96,2,208,244,145,92,160,231,145,92,136,208,251,96,0,2196
630 FORL5=Y1TOY(X):POKE253,L5:SYS51312:NEXT:GOTO240
640 FORL5=Y1TOY(X)STEP-1:POKE253,L5:SYS51312:NEXT:GOTO240
```

# User Group Grapevine

Getting into the trickier aspects of computing can be difficult especially if you're not a member of one of the following user groups. Here's the latest updated listing to help guide you to the boffins of the industry. For changes, insertions or deletions, please fill in the form that appears at the end of this list. Alternatively, call (02) 498 3204 during business hours.

Name: ACT VIC-20 USERS ASSOCIATION :
Postal: 25 Kerferd Street,
Address: Watson ACT Post Code: 2602
Telephone: (062) 412316 aft6pm Contact:

Name: Albury/Wodonga Commodore User Group Abbreviation:
Postal: P.O. Box 1014
Address: Albury NSW Post Code: 2640
Telephone: Contact: D. Willis, Secretary

Name: Amiga Users of the Northern Territory Abbreviation: A.U.N.T.
Postal: C/- 4/4 Armidale Street
Address: Stuart Park NT Post Code: 5790
Telephone: Contact: R. Rawinski

Name: Ballarat C-64 Club :
Postal: 142 Eureka Street
Address: Ballarat Vic Post Code: 3358
Telephone: (053) 331 863
Contact: Cheryl Allen
Meetings: Every Sunday 9.00am

Name: Bay Users Group :
Postal: P.O. Box 308
Address: Nelson Bay NSW Post Code: 2315
Telephone: (049) 811731
Newsletter: GOSUB

Name: Brisbane Commodore Computer Users Group (Qld) I.
Postal: P.O. Box 274
Address: Springwood Qld Post Code: 4127
Telephone: (07) 3415651 Contact: Norm Chambers, Secretary

Name: Bull Creek Vic Ups Commodore Computer Group Abbreviation: V-CBULLC
Postal: 862 Forrest Road
Address: Jandakot WA Post Code: 6164
Telephone: Contact: L. Boelan
Meetings: 1st & 3rd Tuesday
Location: Willton High School

Name: Christchurch Commodore Users' Group, Inc Abbreviation: The C.C.U.G.
Postal: 3 Paulus Terrace,
Address: Christchurch 2 Post Code:
Telephone: 34 382 Contact: Tony Petre

Name: Commodore Computer Users Association Abbreviation: CCUA
Telephone: (047) 391 528 Contact: Tony Ellis
Meetings: 7.30pm on last Wednesday of month.
Location: The 729 Club, Lithgow St St Leonards (informal)

Name: Commodore Great Western Users Group Abbreviation: GRTWEST
Postal: 2 Bridge Street
Address: Granville NSW Post Code: 2142
Telephone: (02) 637 6282
Contact: Lisa Bullivant
Meetings: 1st Tuesday each month
Location: Greystanes Community Centre Merrylands Road, Merrylands
Newsletter: Byte

Name: Commodore Hornsby User Group Abbreviation: CHUG
Postal: P.O. Box 1578
Address: Hornsby, Northgate Post Code: 2077
Telephone: (02) 476 4391 Contact: Jill Rassack, Secretary
Meetings: 7.15pm 4th Wednesday of each month
Location: St Leos College, Woolcott Ave, Waha
Newsletter: Peripheral/Line Feed

Name: Commodore User Group (Townsville)
Address: Post Code:
Telephone: 726454 Contact: Tony Moore
Meetings: 7.30pm 1st Wednesday of each month
Location: Ignatius Park College, Computer Room

Name: Commodore User Group A.C.T.
Abbreviation: CUGACT
Postal: P.O. Box 599
Address: Belconnen ACT Post Code: 2616
Telephone: (062) 48 9527(H) Contact: John Hambley, Secretary
Meetings: 7.30pm 1st Monday/3rd Monday
Location: Melba High School/Woden Library

Name: Commodore Users Group Mackay
Abbreviation: MACK CUG
Postal: P.O. Box 422
Address: Mackay QLD Post Code: 4740
Telephone: (079) 422 068
Contact: Ken Johnston
Meetings: Wednesday fortnightly 7.30pm
Location: Mackay Teachers Centre Nelson Street
Newsletter: Not named at present

Name: Comp-Tel (Telecom User Group)
Postal: 138 Barcom Ave
Address: Rushcutters Bay NSW PC: 2011
Telephone: (02) 231 1111 Contact: O. Davide
Meetings: Mostly by telephone or when necessary by Pitt telephone
Location: exchange
Newsletter: Comp-Tel

Name: Compu-Tech Users Club Abbreviation:
Postal: P.O. Box 43
Address: Islington NSW Post Code: 2236
Telephone: Contact: Geoff Rayner, Secretary
Meetings: Last Tuesday each month, 7.00pm
Location: Newcastle Technical College
Newsletter: Victim

Name: Comstrad Computer Users Group
Postal: 22 Wilson Street,
Address: Caboolture Qld Post Code: 4510
Telephone: (075) 95 3566 /
Contact: Marcus Dwyer
Meetings: 1st/3rd Saturday each month 6-9pm
Location: Caboolture Anglican Church Hall
Newsletter: Syntax

Name: Eastern Suburbs Commodore User Group Abbreviation: ESCUG
Postal: P.O. Box 236
Address: Botany NSW Post Code: 2019
Telephone: Contact: Carol Shearman
Meetings: Every 2nd Monday 8.00pm
Location: State Emergency Services Hall, rear 1355 Botany Street, Botany

# USER GROUPS

Name: Gold Coast Computer Club
Postal: P.O. Box 645
Address: Palm Beach Qld Post Code: 4221
Telephone: (075) 562 336 Contact: Cyril White
Meetings: every 2nd Tuesday 7-9pm
Location: Elanora State School

Name: Gosford Commodore User Group
Abbreviation: GOSCOM
Postal: P.O. Box 86
Address: Umina Beach NSW Post Code: 2257
Telephone: (043) 24 7124 Contact:
Meetings: 3rd Wednesday each month 7.30pm
Location: Niagara Park Public School
Newsletter: Output

Name: Goulbourn Commodore User Group
Postal: 34 Chantry Street
Address: Goulbourn NSW Post Code: 2580
Telephone: (048) 212 704
Contact: Geoff Bassingthwaight
Meetings: 2nd Tuesday each month 7.00pm
Location: Southern Tablelands Education Centre

Name: Horsham Commodore User Group
Abbreviation: HORSHCUG
Postal: P.O. Box 676
Address: Horsham Vic Post Code: 3400
Telephone: (053) 824 345 Contact: Ian Rees
Meetings: 2nd Wednesday each month 7.30pm
Location: Various

Name: Katoomba Commodore User Group
Postal: 10 Rosebery Street,
Address: Wentworth Falls NSW PC: 2782
Telephone: (047) 57 1408 Contact: P. Edwards
Meetings: Every 2nd Tuesday 7.30pm
Location: Katoomba High School

Name: Knoxcom Inc. Commodore Users Group
Postal: 71 Folkstone Cres
Address: Ferntree Gully Post Code: 3156
Meetings: 8.00pm, second Thursday each month.
Location: Boronia Community Centre, Park crs Boronia

Name: Macquarie Fields Commodore User Group
Telephone: (02) 610 3685
Contact: Andrew Price
Meetings: 2nd & 4th Wednesday each month
Location: Macquarie Fields Community Hall, Fields Road, Macquarie Fields

Name: Melbourne Commodore Computer Club Inc.
Postal: P.O Box 177
Address: Box Hill Post Code: 3128
Telephone: Contact:
Meetings: 7.30pm. third Tuesday each month.
Location: Nunawading Civic Centre

Name: Mermaid (Business) Users Group
Postal: P.O. Box 76
Address: Mermaid Beach Post Code: 4218
Telephone: (075) 39 8427 Contact: Ron Perry
Meetings: Fortnightly
Mermaid Computers, "Home In"
Location: Shopping Complex, Gold Coast Hwy, Mermaid Beach

Name: NZ Microcomputer Club
Abbreviation: NZMICROC
Postal: P.O. Box 6210
Address: Auckland, New Zealand Post Code:
Telephone: 64 9 452 639
Contact: Terry Bowden
Meetings: 1st Wednesday each month 7.30pm
Location: 107 Hillsborough Road, Mt. Roskill
Newsletter: NZ Micro in Bits & Bytes Magazine

Name: Peninsula Commodore Users Group
Abbreviation: PENCUG
Postal: C/o Red Hill Consolidated School
Address: Flinders Rd, Red Hill Vic PC: 3937
Telephone: (059) 895 785
Contact: Luke Button
Meetings: 1st Wednesday/3rd Tuesday
Red Hill Consolidated School,
Location: cnr. Arthurs Seat Rd & Flinders Rd, Red Hill

Name: Pittsworth Microcomputer Users Society
Postal: P.O. Box 166
Address: Pittsworth QLD Post Code: 4356
Telephone: Contact: David Siebuhr
Meetings: 1st Monday each month 4pm
Location: Masonic Hall
Newsletter: Pittsworth Microcomputer Users Soc

Name: RAAF Laverton Commodore User Group
Postal: R.A.A.F. Base, Laverton
Address: Melbourne Vic Post Code: 3027
Telephone: (03) 3682457 Contact: Neville Hewlett, Secretary

Name: Rockhampton Commodore Users Group
Abbreviation: ROCHCUG
Postal: P.O. Box 5733
Address: Rockhampton Mail Centre Qld Post Code: 4702
Telephone: Contact: Kay Lanyon
Meetings: 1st Monday each month
Location: Berserker Street School
Newsletter: RCUG Newsletter

Name: South Australian Commodore Computer Users Group
Postal: P.O. Box 427,
Address: North Adelaide SA Post Code: 5006
Telephone: (08) 263 6349 (H)
Contact: Lilly Woer
Meetings: 7.30pm 1st Tuesday of each month
Location: Gillies Street Primary School, Gillies Street, Adelaide
Newsletter: Bits and Bytes

Name: Southern Districts Commodore Users Group
Abbreviation: STHDIST
Postal: 3 Lucille Crescent
Address: Casula NSW Post Code: 2170
Telephone: (02) 602 8691 Contact: L. Toms
Meetings: 1st/3rd Wednesday each month 6-8pm
Location: API Hall, Kurrajong Road, Prestons

Name: Southport Commodore Computer Users Group
Abbreviation: S.C.C.U.G.
Contact: Merv McFarlane,Secretary
Meetings: Every Monday 7pm
Labradore State Primary School,
Location: Gordon Street Entrance

Name: Springvale CUGVIC Abbreviation:
Postal: 10 Sheridan Court
Address: Dingley VIC Post Code: 3172
Telephone: Contact:
Meetings: 2nd Monday each month
Location: Dingley Community Centre
Newsletter: Commodore 64 User Group

Name: Sydcom
Postal: P.O. Box 1542
Address: Sydney NSW Post Code: 2001
Telephone: (02) 521 8765
Contact: Barrie Bartin
Meetings: 2nd Wednesday each month 7.30 - 10.00pm
Location: Ryde Catering College, Blaxland Rd Ryde - opposite Kulgoa Ave
Newsletter: Peripheral

Name: Tamworth C.Y.S.S. Abbreviation:
Postal: P.O. Box 1104
Address: Tamworth NSW Post Code: 2340
Telephone: (067) 665 136
Contact: Mr. Mark Nickols

# USER GROUPS

Name: Tasmanian Commodore Users
Association Abbreviation:
Postal: G.P.O. Box 673
Address: Hobart Tas Post Code: 7001

Name: The Commodore User`s Group
(Victoria) Inc
Postal: P.O. Box 64
Address: Abbotsford Vic Post Code: 3067
Newsletter: Commodore 64 User's Group

Name: The Happy Hackers Adventure Club
Abbreviation: ADVNTNEW
Postal: MSF 550
Address: Toogoolawah QLD Post Code: 4313
Telephone: (075) 83 5119
Contact: Stuart Elflett
Meetings: Postal Group
Location: Australia Wide
Newsletter: Adventure News

Name: The Shepparton Commodore Computer Club
Telephone: (058) 214746
Contact: Val Hutchinson
Meetings: Sunday evening, 7.30pm
Location: 1st Shepparton Scout Hall,
Welsford Street, Shepparton
Newsletter: The Communicator

Name: Tuggerah Lakes Commodore Users Group
Postal: 125 Woolana Aveune
Address: Budgewoi NSW Post Code: 2262
Telephone: (043) 907 339
Contact: Frank James
Meetings: 1st & 3rd Thursdays at 6.30pm
Location: Old Primary School, Wyong
cnr. Alison Rd & Rankin St

Name: VIC-UPS Computer User Group
Postal: P.O. Box 178
Address: Nedlands WA Post Code: 6009
Telephone: (09) 332 5313
Contact: Russ Coppins
Newsletter: VIC-UPS News

Name: VIC-UPS Nedlands (Inc)
Abbreviation: V-UNEDL
Postal: P.O. Box 386
Address: Claremont WA Post Code: 6010
Telephone: (09) 367 1462
Contact: Norm Holtzman
Meetings: 2nd & 4th Saturdays each month
1.30pm - 4.30pm
Location: Hollywood Senior High School
Smyth Road, Nedlands
Newsletter: Vic-Ups News

Name: VK Commodore Users Group
Abbreviation: VKCUG
Postal: P.O. Box 168
Address: Launceston Tas Post Code: 7250
Telephone: (003) 26 2401
Contact: R.K. (Bob) Richards
Meetings: On amateur radio 3.570MHZ
0900 UTC Sundays

Name: Waverley Commodore User Group
Postal: C/- 329 Springfield Road
Address: Nunawading Vic Post Code: 3131
Telephone: (03) 569 8481
Contact: H. Younger
Meetings: 4th Thursday 7.30pm
Location: Alvie Hall, Alvie Rd, Mt. Waverley

Name: Wollongong C-64/C128 Users Group
Postal: 155 Jacaranda Ave
Address: Figtree Post Code:
Telephone: (042) 288580
Contact: P. Stanhope,Secretary

Name: Yarra Valley Commodore Users Group
Postal: P.O. Box 176
Address: Lilydale Vic Post Code: 3140
Telephone: (03) 725 0682
Contact: Dorothy Millard
Meetings: 1st Tuesday each month 8.00pm
Melba Hall
Location: Cnr. Market & Castella Sts Lilydale

## User Group Grapevine Registration Card

To register any additions changes or deletions to our user group listing please use this form. We will endeavour to keep in contact eith all registered groups and provide them with special offers on the purchase of our magazines.

Name : .....
Abbreviation : ..... Total Membership : .....
Postal Address : .....PC .....
Telephone : (.....)..... Contact Person : .....
Meeting Details - Time/Day : .....
Location : .....
Newsletter/Magazine - Name : ..... Frequency : .....
BBS Name : (.....) ..... Sysop : .....
System Name : ..... Hours : .....
Access : .....
Other Information: .....
.....

**Post to: Andrew Farrell**
**Top Rear, 4 Carrington Rd,**
**Randwick, NSW 2031.**

# POWER CARTRIDGE®

A special KCS switching technique allows a program to be stored completely outside the memory of your Commodore 64/128. Using this system KCS developed the POWER CARTRIDGE. The 16K Cartridge, 100% machine code, gives the user an optimal extension to his normal computer.

## POWER TOOLKIT

A powerful BASIC-Toolkit (Additional helpful commands) that considerably simplifies programming and debugging.

| | | |
|---|---|---|
| AUTO | HARDCAT | RENUMBER |
| AUDIO | HARDCOPY | REPEAT |
| COLOR , | HEX$ | SAFE |
| DEEK | INFO | TRACE |
| DELETE | KEY | UNNEW |
| DOKE | PAUSE | QUIT |
| DUMP | PLIST | MONITOR |
| FIND | ILOAD | BLOAD |

**RENUMBER** : *Also modifies all the GOTO's GOSUB's etc. Allows part of a programme to be renumbered or displaced.*
**PSET** : *Set up of printer type.*
**HARDCAT** : *Prints out Directory.*

The toolkit commands can be used in your programmes.

## DISK TOOL

Using POWER CARTRIDGE you can load up to 6 times faster from disk.
The Disk commands can be used in your own programmes.

| | | |
|---|---|---|
| DLOAD | DVERIFY | DIR |
| DSAVE | MERGE | DEVICE |
| DISK | | |

**MERGE** : *Two BASIC programmes can be merged into one.*
**DISK** : *With DISK you can send commands directly to your disk.*

## TAPE TOOL

Using POWER CARTRIDGE you can work up to 10 times faster with your data recorder. The Tape commands can be used in your own programmes.

| | | |
|---|---|---|
| LOAD | SAVE | VERIFY |
| MERGE | AUDIO | |

## POWERMON

A surprisingly powerful machine language monitor that is readily available and leaves all of your Commodore memory available for programming.
Also works in BASIC-ROM, KERNAL and I/O areas.

| | | |
|---|---|---|
| A ASSEMBLE | I INTERPRET | S SAVE |
| C COMPARE | J JUMP | T TRANSFER |
| D DIS-ASSEMBLE | L LOAD | V VERIFY |
| | M MEMORY | W WALK |
| F FILL | P PRINT | X EXIT |
| G GO | R REGISTER | $ DIRECTORY DOS Commands |
| H HUNT | | |

## PRINTERTOOL

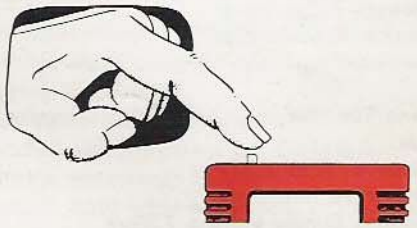
The POWER CARTRIDGE contains a very effective Printer-Interface, that self detects if a printer is connected to the Serial Bus or User-Port.
It will print all Commodore characters on Epson and compatible printers.
The printer-interface has a variety of set-up possibilities. It can produce HARDCOPY of screens not only on Serial printers (MPS801, 802, 803 etc) but also on Centronic printers (EPSON, STAR, CITIZEN, PANASONIC, etc).
The HARDCOPY function automatically distinguishs between HIRES and LORES. Multi-colour graphics are converted into grades of grey. The PSET functions allow you to decide on Large/Small and Normal/Inverse printing.
The printer PSET functions are:

**PSET 0** - *Self detection Serial/Centronics.*
**PSET 1** - *EPSON mode only.*
**PSET 2** - *SMITH-CORONA mode only.*
**PSET 3** - *Turns the printing 90 degrees!!*
**PSET 4** - *HARDCOPY setting for MPS802/1526.*

**PSET B** - *Bit-image mode.*
**PSET C** - *Setting Lower/Upper case and sending Control Codes.*
**PSET T** - *All characters are printed in an unmodified state.*
**PSET U** - *Runs a Serial printer and leaves the User-port available.*
**PSET Sx** - *Sets the Secondary address for HARDCOPY with Serical Bus.*

**PSET L1** - *Adds a line-feed, CHR$ (10), after every line.*
**PSET L0** - *Switches PSET L1 off.*

## POWER RESET



On the back of the POWER CARTRIDGE there is a Reset Button. Pressing this button makes a SPECIAL MENU appear on the screen.
This function will work with any programme.

**CONTINU** - *Allows you to return to your program.*
**BASIC** - *Return to BASIC.*
**RESET** - *Normal RESET.*
**TOTAL BACKUP DISK** - *Saves the contents of the memory onto a Disk. The programme can be reloaded later with BLOAD followed by CONTINUE.*
**RESET ALL** - *RESET of any programme.*
**TOTAL BACKUP TAPE** - *As BACKUP DISK but to TAPE.*
**HARDCOPY** - *At any moment, prints out a Hardcopy of the screen. Using CONTINUE afterwards you can return to the program.*
**MONITOR** - *Takes you into the Machine language Monitor.*

**...it's dynamite!**

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Dordrecht - Netherlands

OziSoft

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Surry Hills NSW 2010
Phone (02) 211 1266